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*THE SURGICAL TREATMENT OF POTT'S DISEASE.**

READ BEFORE THE ORTHOPÆDIC SECTION OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA, OCTOBER 20, 1893.

BY W. W. KEEN, M.D.,

Professor of Principles of Surgery and of Clinical Surgery in the Jefferson Medical College.

THE first laminectomy for Pott's disease seems to have been done by Jackson, of Sheffield (*Brit. Med. Journ.*, 1883, i. p. 812); but the modern surgery of Pott's disease really dates from the operation of Macewen (*Lancet*, 1885, i. 881), when he operated on a case of paraplegia with incontinence of urine and fæces, due to a connective-tissue tumor at the seat of angular curvature of the spine. In this boy, nine years of age, between the theca and the bone was found a fibrous neoplasm one-eighth of an inch in thickness, firmly attached to the theca and covering two-thirds of its circumference. After this was dissected away, the cord was able to expand backward, and pulsation, which had been absent, showed itself, especially opposite the fifth dorsal vertebra. Twenty-four hours after the removal of the pressure the limbs had lost their livid color and were warm; the spastic rigidity was greatly lessened; the perception of tickling the soles had returned and that of touch was improved. Movement was first observed eight days later, and soon after this he had perfect

* The first part of this paper is part of a paper on the "Surgery of the Spine" in the supplementary volume of Buck's "Reference Hand-Book of the Medical Sciences."

control over the sphincters. After six months he was able to go about without support. Five years afterwards he could walk three miles; attended school regularly, joining in all the games, including even foot-ball.

A second and more aggravated case (*Brit. Med. Journ.*, 1888, ii. 308), operated on in 1884, showed a slight tumor with organic changes in the cord, which had shrunk to about half its normal dimensions. In ten hours after the operation the limbs had lost their lividity and felt warm. From the fourth day she obtained control over her bladder and rectum; six weeks after the operation she could move her limbs freely; and two months after walked a quarter of a mile and was able to perform light duties in the house.

Three other similar cases were operated on, one of which was successful, but the other two died. Besides these cases, he reported the evacuation of an abscess in the posterior mediastinum, which was pressing on the heart and bronchi. This case was also completely successful.

Another similar and striking illustrative case is reported by Southam (*Brit. Med. Journ.*, 1892, i. 655), in a child three and a half years old, all four extremities being so paralyzed that the patient lay helpless in bed, with incontinence of both urine and fæces. In this case, at two operations three months apart, he removed the laminæ from the fourth cervical to the first dorsal vertebra inclusive, and removed a quantity of granulation tissue. But little improvement was noticed for nine months after the second operation; then—a most important point of encouragement—the child began to improve, and when the case was reported two years later could walk without assistance and had control over the sphincters.

The source of the nervous symptoms seems not generally to be the mere curvature of the spine, nor the acute myelitis, but the pressure caused either by fungous masses of granulation tissue over the bodies of the vertebræ by inflammatory swelling, but oftenest by a chronic pachymeningitis, or by the accumulation of pus. For instance, W. Arbuthnot Lane (*Lancet*, 1891, ii. 989) reports eleven cases of Pott's disease in which the compression in all but one was caused by an abscess. In none of these were there any fibrous neoplasms, such as are described by Macewen. In such cases death follows either as the result of pulmonary complications, or more frequently from cystitis and renal complications, bed-sores, pain, sleeplessness, etc. In all of Lane's cases the large amount of disease would have precluded a cure by anchylosis. He urges, therefore, that "every case of paraplegia due to spinal caries should be operated on with as little delay as possible." In view, however, of published clinical results, especially as shown by Lloyd (*Annals of Surgery*, October, 1892, 289), who has tabulated seventy-five cases of laminectomy for Pott's disease, this opinion seems too sweeping if taken without reservation. Thus, Meyers has reported recovery from paraplegia in fifty-five per cent. of two hundred and eighteen cases, Gibney fifty per cent. in fifty-eight cases, Taylor and Lovett ninety per cent. in nineteen cases, and Sayre ninety per cent. in thirty-eight cases. The views of Burrell and Bullard and Kraske seem to be the more reasonable. "So long as we have reasonable or even moderate chances of recovery without operation," say the former authors, "we do not believe it advisable or justifiable, in the present condition of spinal surgery, to perform so serious an operation as the resection of the laminæ." Kraske's rule for interference is well expressed. "It is necessary before operating to have exhausted all other methods of treatment. I would say interfere when a paralysis of the bladder is established; this is the one symptom which is so serious as to justify everything" (Lloyd). To which Lloyd adds, that "the first sign of degeneration of the cord should indicate immediate operation." It will be especially observed that ordinary cases of mere curvature from Pott's disease are excluded, and only those in which paraplegia with all its dire evils has resulted from the caries should be considered suitable for operation, and then only with the limitations already stated. If there are other tubercular complications it is contraindicated.

It will be observed that the cases above referred to fall into two categories: First, the cases of paraplegia from pressure, either by masses of granulation tissue which may arise from the vertebræ within the spinal canal or from thickening from pachymeningitis,—a thickening which, for instance, in Macewen's case, amounted practically to a tumor so far as pressure on the cord is concerned; secondly, cases of paraplegia as a result of pressure on the cord from abscesses resulting from the breaking down of the granulation tissue. Cases of paraplegia from either of these lesions may be treated by laminectomy, with removal of the neoplasm, the granulation tissue, the pus, the carious bone, etc., by the usual means employed in such cases, provided they fulfil the conditions already mentioned.

Besides these there are many cases of ab-

scesses in Pott's disease in which modern surgery has of late achieved notable improvements in the way of preventing the later lesions of the cord, which may properly be briefly alluded to. Until within a few years surgical interference has been limited to evacuation and drainage of these abscesses at their lowest point,—*e.g.*, at the thigh below Poupart's ligament,—with or without curetting or injection of iodoform in ether or an emulsion of iodoform in olive oil. This left the source of the evil—the carious vertebræ—untouched and also very imperfectly treated the abscess. Mr. Treves, in June, 1884 (*Med.-Chir. Trans.*, vol. lxvii.), urged the evacuation of psoas abscess in the loin, combined with the removal of the carious and necrosed bone by the usual means employed elsewhere.

This method he has perfected and extended, and at the present time carries it out as follows, which I condense from his "Manual of Operative Surgery" (ii. 731): A vertical incision two and a half inches long is made in the loin, whether it be in lumbar or psoas abscess, in order to reach the spine itself rather than merely to drain the abscess at its lowest point. The centre of this incision is midway between the crest of the ilium and the last rib. It is about two and a half inches from the lumbar spines. The lumbar aponeurosis and the attached muscular fibres of the latissimus dorsi are divided the entire length of the incision, thus exposing the erector spinæ, which is drawn strongly towards the middle line, exposing the middle layer of the lumbar fascia. Through this can readily be felt the transverse process of the third lumbar vertebra. A vertical incision, as near the transverse processes as is convenient, exposes the quadratus lumborum, which here is very thin. The quadratus is divided close to the extremity of the transverse processes, and the incision cautiously enlarged until the muscle is divided to the full extent of the external wound. The abdominal branches of the lumbar arteries may easily be wounded, but care should be exercised to avoid them, as well as the main trunks of the lumbar vessels, by keeping close to the transverse processes and reaching the spine by following them.

The inner edge of the quadratus is overlapped by the psoas muscle, and on dividing the quadratus the psoas is therefore exposed. As the fibres of the two muscles run almost parallel, it is important to observe that the interval between them can be recognized by a thin but distinct layer of fascia, known as the anterior layer of the lumbar fascia. Next, the tendinous fibres of the psoas arising from the transverse processes having been divided, the finger is introduced beneath the muscle until it reaches the anterior aspect of the bodies of the vertebræ, when the incision can then be enlarged as far as is necessary. All risk of wounding the peritoneum will be avoided by making the incision in the quadratus as near the transverse processes as possible.

When the abscess cavity is well opened, the anterior surface of the spine is examined by the finger. An irrigator is then introduced into the abscess, and it is flushed by many gallons of sublimate solution (1 to 5000). While this is being done, the position of the patient is repeatedly changed, so as to fill and again empty the abscess cavity many times. During this washing out, the finger is introduced into every accessible portion of the abscess, diverticula are opened by it, collections of caseous matter scraped away with the finger-nail, and in general all the tubercular granulation tissue got rid of as far as possible. The sharp spoon can be used, but, should be used with caution, especially on the anterior wall, which is thin. Mr. Treves thinks a piece of fine Turkish sponge on a long sponge-holder is the best means of removing the granulation tissue, by wiping and scrubbing the inner wall with a rotary movement of the sponge in every part of the abscess and its diverticula. I have found the ordinary gauze sponges equally good; but to accomplish the object in view much time, many sponges, and prolonged and thorough scrubbing, rubbing, and wiping of the interior of the abscess are necessary. When the sponge or gauze is drawn out practically unsoiled, then the cavity can be regarded as prepared for healing. During this process, or as a separate stage, thorough flushing out is again accomplished. Finally, the abscess is wiped dry and the wound closed by a series of silkworm-gut sutures, including the muscular and tendinous structures. Then the ordinary antiseptic dressing is placed over the wound, and I also prefer to place a large abdominal pad over the site of the abscess anteriorly, so as to assist in obliterating the cavity by pressure. "The subsequent treatment," in the words of Mr. Treves, "consists in absolute rest in the recumbent position for a period of months,—a period which may easily be too short, but can hardly be too long." In adults it will probably be over a year; in children somewhat less. If it can be spent in the best hygienic conditions, out of doors, at the sea-side, etc., so much the better.

A second similar operation may be needed, but Mr. Treves states that on no occasion has he had to do a third operation.

Sometimes Mr. Barker's hollow-handled flushing gouge or sharp spoon, which answers so well for bone, can be used also in these abscesses, but must be used with caution.

In the cervical region retro-pharyngeal abscesses are usually accessible through the mouth, and the bone can also be treated by the same route. Burckhardt (*Centralbl. f. Chir.*, 1888, No. 4) has advocated an external incision at the inner border of the sterno-cleido mastoid, reaching the abscess by the inner side of the sheath of the vessels. Chiene, as early as 1877, advocated a similar operation on the outer border of the sterno-cleido mastoid, and Kramer (*Centralbl. f. Chir.*, 1892, No. 12) has successfully carried out Burckhardt's proposed operation with ease. These operations have the advantage, of course, of permitting more thorough antisepsis than the oral route, but the mortality of the latter has been very small. In abscesses in the cervical region, with difficulty accessible by the mouth, however, these methods of operating will probably prove of greater value than that by the mouth.

In the dorsal region, Shafer (*Journal of the American Medical Association*, December 19, 1891, 943) proposed "to incise the soft tissues one inch from the spinous processes, uncover and remove the transverse process of the diseased bone or of the one just below it, and resect the head and neck of the corresponding rib. This permits a large finger to reach the postero-lateral angle of the diseased bone, and gives room for the introduction of the curette, sharp spoon, or forceps, and leaves a large space for a drainage-tube. Should it be desired to carry the drainage-tube through the column, the transverse process with the end of the rib of the opposite side can also be removed, when it can readily be passed through."

A somewhat similar method was published four months later by Vincent (*Rev. de Chir.*, April, 1892, 273). In this somewhat elaborate paper he describes three different methods of side-to-side drainage: (1) prevertebral drainage,—that is, in front of the bodies of the vertebræ; (2) premedullary drainage,—that is, in front of the spinal cord and its membranes, in case of the destruction of the bodies; and (3) vertebral trans-somatic drainage, or drainage through the bodies of the vertebræ. In all cases he selects the point of greatest curvature, makes an incision along the external border of the erector spinæ eight to ten centimetres in length, with a transverse incision from the middle of the first and at right angles to it, about five centimetres long. One or two ribs are resected, the intercostal muscles separated, the pleura and the tissues in the chest are detached by the finger or any blunt instrument, and, following the track of the granulation tissue and the sinuses, we are able finally to pass the drainage-tube from side to side. The method is not essentially different, whether the tube is passed in front of the bodies of the vertebræ or behind them and just in front of the medulla and its membranes. In the latter case great care should be taken not to puncture or otherwise injure the membranes or the cord itself. Only widespread destruction of the bodies of the vertebræ would allow of premedullary drainage.

In vertebral trans-somatic drainage, the earlier steps are precisely the same as before, with the addition that, by means of the curette or perforator or other such instrument, the body of the vertebra is perforated from each side and the drainage-tube carried through the canal so made.

Shafer reports three cases, in one of which the sinuses, excepting one, all healed in two months and in six months after the operation the patient left the hospital, but a year after the operation she died of pulmonary tuberculosis. In the second case, in which the same procedure was used in the cervical region, there was very serious hemorrhage (checked by packing) in the cavity of the body of the fourth cervical, and the disturbance of the vertebral column was such that her neck felt as though it were broken. A jury-mast enabled her to walk about, and she was discharged from the hospital six weeks after the operation. About six months later (the time is indefinite) the jury-mast was laid aside, she could hold her head erect, was engaged about the house and feeling well. In the third case there was caries of the body of the sacrum, with secondary inflammation of the trochanter major. The patient was somewhat more comfortable after the operation, although the prognosis as to his lungs was very bad.

Vincent reports two cases,—one of trans-somato-vertebral drainage and the other of prevertebral drainage. The first made an excellent recovery; the second died.

The conclusion that I should reach as to this somewhat heroic method is very much that of Vincent: "We cannot as yet come to a conclusion in favor of such operative procedures in Pott's disease. All we can say actually is that they have been practised without accident" (?)—and with varying results. The procedure will only be occasionally useful, and great care must be taken to avoid wounding the pleura, the ganglia of the sympathetic, and the spinal nerves. The intercostal arteries are almost in-

evitably injured, and it seems possible that even the vertebral was involved in one of Shafer's cases.

THE VALUE OF THE COLD BATH IN THE TREATMENT OF ASTHENIC DISEASES OTHER THAN TYPHOID FEVER.

BEING THE OPENING OF THE DISCUSSION ON THIS SUBJECT BEFORE THE SECTION ON THERAPEUTICS OF THE PAN-AMERICAN MEDICAL CONGRESS.

BY SIMON BARUCH, M.D.

THE very fact that this subject has been chosen for discussion is a happy augury for rational therapeutics. When I have hitherto referred to the cold bath as a method of treatment for an asthenic disease I have almost invariably been met with the query, "Would not the shock be too depressing to the patient?" The question for discussion here is an evidence of an awakening to the value of the best remedy for asthenic conditions which we have. Instead of defining asthenia, let us take as an example the most typical form we meet, one a temporary, the other a more enduring condition. Surely a woman who has fallen in syncope presents the most complete picture of asthenia. Her pulse is feeble or absent, her respiration is shallow, sensation and motion are practically abolished, the patient's vital powers lie dormant, as it were. What is the treatment which usage has so sanctioned that even lay people constantly resort to it? The application of cold water to the periphery—the face or chest—is the remedy. You are all familiar with the result; the merest tyro in medicine can give its rationale. There is a reflex stimulus to the nerve-centres, a deep inspiration ensues, the wheels of life again are set in motion, color returns to the pallid cheek, the glazed eye brightens, the pulse beats again. The asthenic condition is removed as no other agent can remove it.

Let us take a more frequent asthenic condition. A patient suffering from an infectious disease lies prostrate, with thready pulse, shallow breathing, dull eye, picking at the bedclothes, subsultus, involuntary defecation. All these remind us that here we have the very climax of asthenia. What shall we do? Will digitalis and strophanthus arouse a heart whose response depends upon these obtunded nerve-centres? Strychnine gives us some, because it stimulates the nerve-centres. But seat such a patient in a shallow warm bath, and pour with some force one or two basins at 75° F. or less over his head and shoulders; rub him gently; repeat if indicated. The result will astonish those who have not tried it. There is a gasp for breath, the dull eye resumes its lustre, the facial cyanosis yields to a better hue, the pulse becomes slower and less compressible. The wheels of life are again set in motion; not, as in the case of syncope, to remain so, but to again be overbalanced by the toxic blood which supplies the nerve-centres. Again and again this affusion must be repeated. Fear not the so-called shock, for this is just what you want to evoke; it is, when judiciously administered, followed by reaction, and reaction is the great stimulus, greater than all medicinal agents or alcoholic stimulants. These are clinical facts, observations made at the bedside; they are at least as valuable as those made on medicinal agents.

In low forms of scarlatina, when the feeble, rapid, thready pulse and cyanotic appearance of the skin present every feature of asthenia, several dips of the patient into water at 60° to 75° F., followed or accompanied by friction, arouses the feebly-acting heart more quickly and reliably than all other known stimulants.

What is the rationale of the action of cold water in these typical cases of asthenia? Heart-failure stands like a spectre at the bedside, and the physician often labors in vain to banish it. Heart-failure kills; heart-failure is the culmination of asthenia. How does the application of cold to the periphery restore vigor to the drooping heart? Macy, Traube, and others have shown that in these asthenic conditions we have a loss of tone in the smaller vessels, a paresis of the muscular coat and of the elastic tissue which acts the part of muscular coat in the peripheral capillaries. Now, it is a well-known physiological fact that the circulation of the blood depends not only upon the vigorous healthful action of the heart, but also upon the integrity of the arteries and capillaries by whose elastic resiliency the blood is propelled through the finest tubes. Surely the propulsion of a viscid fluid like blood through such fine tubes would be impossible unless the latter were endowed with propulsive power. What results when the latter is lost or in abeyance? The heart must increase its force to overcome an obstruction at points where it formerly received aid. It is pumping against paralyzed vessels; the blood stagnates in the smaller ones, giving rise to hypostatic congestion, and thus is the difficulty increased. No wonder that the heart labors harder, that the pulse-rate increases and its tension is lowered. No wonder that its ganglionic forces are exhausted and that the heart yields at last to the dread pressure upon

its vital forces, which are sapped besides by the toxic blood supplying it. Apply a judicious hydrotherapic procedure in such a case; let it be cold affusion, dip, spray, ablution, a bath, but let it be adapted to the case and always accompanied by friction. What is the result? There is a local stimulus to the coats of the superficial vessels; they contract again under the impact of repeated cold wave followed by friction. Their paresis is removed; they again propel the blood as was their wont. The dam is cut, as it were; the blood again flows freely through the terminal vessels; the heart responds to the relief afforded by a slower and more deliberate contraction; we have normal tension and absence of dicrotism. At the same time the central nervous system is bathed by cooler blood, blood which is better oxygenated, and thus the cardiac ganglionic centre receives new life at one end, while at the other the labor of propelling the blood is removed. If any one doubts this rationale, let him see the deadly pale skin (except the dusky face) of advanced typhoid redden under this procedure and come out glowing with the roseate hues of health, and he will be convinced; let him see the marbled skin of a low scarlatina brighten up under the friction and bathing and resume its color, and he will no longer doubt. In chronic conditions phthisis offers a good illustration of the effect of hydrotherapy in removing the obvious asthenic conditions.

We have the testimony of Ziemssen, who refers to it as "a remedy of extraordinary value." Indeed, clinical demonstration of the "value of the cold bath in asthenic conditions" is abundant. The Montefiore Home for Incurables receives its supply of patients from other hospitals which decline to retain them on account of their incurability and protracted nature. Here I have had an opportunity of testing this question in a satisfactory manner in cases of phthisis, Bright's disease, diabetes, and a variety of functional and organic nervous diseases which make the institution the Salpêtrière of America. The gradual education of the reactive capacity in these desperate cases and the improvement of the nutrition in many of them offer interesting illustrations of what may be accomplished by the methodical application of water. The annual reports of the institution furnish the details, with which I need not burden you here. I will cite only two cases from private practice that may be of interest. A young man from Kentucky, who had been pronounced phthisical (right apex, first stage) by Dr. Janeway, whose sputum had been referred to the Vanderbilt Clinic Laboratory to culture bacilli, without appetite, emaciating for six months, was treated at the Hydriatic Institute from August, 1892, to January, 1893, with the result of sixteen pounds' gain, complete removal of bacilli (examined at the Vanderbilt Laboratory by Dr. Van Giesen seven times). He remained well. His brother is now under treatment for the same (more advanced) trouble, and has gained four pounds in three weeks. A middle-aged lady, who had cervix and perineum operated on by Dr. Ralph Waldo, and who had been bedridden for two years, was advised by Dr. Charles Carroll Lee, called in consultation by Dr. Waldo, to place herself under hydriatic treatment. She was carried into the institute by her husband and brother, presenting every manifestation of pronounced neurasthenia of the melancholic type. Her reactive capacity was feeble, but it was gradually raised, until after six months' treatment she asked to be allowed to use a bicycle, so active and strong had she become. She is now in good health.

With these brief histories I may conclude my commendation of the "cold bath in asthenic conditions," acute or chronic.

THE CLASSES OF INVALIDS MOST BENEFITED AT ATLANTIC CITY.

READ BEFORE THE CONGRESS OF MEDICO-CLIMATOLOGY IN CHICAGO, JUNE 3, 1893.

BY BOARDMAN REED, M.D., ATLANTIC CITY, N. J.

NERVE exhaustion, or, in popular parlance, nervous prostration, is, in its various forms, the disease most certain to be benefited at Atlantic City. Probably a prolonged sea-voyage or a sojourn at some of the other seashore resorts might be equally helpful. I cannot say as to this, but confine myself to a report of facts carefully observed during a residence of more than fifteen years.

Sea air, as exemplified at Atlantic City, is a nerve tonic of the utmost value. Whether the unfortunate victim of an overtaxed nervous system chances to arrive in a rain which confines him to his hotel (as will sometimes happen, especially in the winter or spring), or whether he finds all sunshine and brightness, he—or more often it is she, since the majority of neurasthenics are women—will nearly always begin at once to eat and sleep better. Fine weather, though helpful, is not essential, and most cases will gain even in spite of it. With quickened appetite and sounder sleep come an enriched blood and refreshed nerve-centres.

All the vital processes are heightened, and health is usually and often rapidly restored.

True, there are exceptions. Occasionally a nervously-depressed patient, who considers himself merely run down from overwork or other cause, comes to Atlantic City, puts up at one of the best hotels, and sets out to get well by doing as he sees others do, yet fails utterly, returning home after one or two weeks worse, perhaps, than before. There are usually excellent reasons for these failures. One of the most common is the existence of derangements of the stomach or liver, which are suffered to go without proper treatment. Sea air is simply a tonic, —a powerful and effective one in most cases, but still only a tonic and not a corrective of faulty secretions. The patient who has been trying to overcome an increasing debility by forcing larger quantities of food—often very unsuitable food at that—upon an unwilling, because unhealthy, stomach, with the help, perhaps, of an unaccustomed amount of stimulants, until his tongue has become foul and his entire digestive apparatus on the point of revolting, will not recover by the mere fact of sojourning at any sea-side place. If he has gone on in this way until his urine has become loaded with urates, his joints stiffened, his temper moody and despondent, and his sleep considerably impaired, the sea air, though a most valuable aid in the task of curing, will do next to nothing until the way has been cleared for its proper action by a judicious course of medical treatment instituted either by the physician at home or by some competent local practitioner at the shore after the patient has arrived there. Fortunate is it for the poor neurasthenic if he or she has not let matters drift along until insomnia has developed into a chronic condition and the habit of taking some narcotic drug has become fixed. These are the cases which try the souls of physicians everywhere; but even these will do well and usually recover at Atlantic City, if placed under proper conditions, and especially if they can have the benefit of the Weir Mitchell "rest-cure" (or some modification of it in the less severe cases), under the guidance of a physician and nurse experienced in such special treatment.

Closely allied to neurasthenia is simple atonic dyspepsia, and this rarely fails to respond to the healthy stimulus of the sea air, especially when the diet and exercise have been properly regulated. In the worst cases the aid of medicine, as well as of electricity and massage, is sometimes necessary, but many recover with only the simplest hygienic treatment.

Convalescents from operations, as well as from fevers or other acute prostrating diseases, will also derive the greatest benefit in nearly all cases from a removal to Atlantic City. Like the nervous cases, these may be expected to gain rapidly even if still confined to their rooms. It is a constant experience to see them taking on flesh and growing stronger at a surprising rate even before it is possible to get them out of doors.

The chronic diseases peculiar to women are generally improved and often markedly so by the invigorating properties of the climate. It tends to bring up the nutrition and nerve tone, thus indirectly relieving congestion and catarrhal states of the pelvic organs. Many of the diseases of childhood are promptly and often remarkably benefited. Persistent cases of summer complaint, as well as nearly every form of malnutrition in children, including especially scrofula, rickets, chronic joint-disease, and chronic bronchitis, find in the atmosphere of the locality a positive and decided adjuvant to other therapeutic resources. In some of these cases the air alone proves rapidly curative without further medical intervention.

In adults, as well as children, chronic bronchitis, chronic pleurisy, and delayed resolution of pneumonic exudations may usually be expected to do well at the same place. In most of such cases it is advisable to persist at the same time with the usual therapeutic measures in order to insure the promptest results.

Anæmia, chlorosis, and struma are benefited by sea air, and, under proper regulations and restrictions, even more markedly so by sea-bathing. But it is highly important to see to it that patients afflicted with these or other maladies shall exercise caution as to the length and frequency of their baths. For some only the very briefest dip in the ocean will be needed to obtain the curative effect or can be safely borne; others should be prohibited altogether from ocean-bathing. At least equal care is needed as to the manner in which the warm or hot sea-water baths are taken. Patients are prone to look upon these as entirely safe for anybody at all times, and to suit their own inclinations as to the temperature of the water and the length of time they remain in it; but no experienced physician need be told that delicate invalids cannot all bear safely a prolonged soak in hot water, whether salt or fresh.

The above-mentioned diseases form only a small part of the many which are benefited by the climate of Atlantic City, but they include those in which I have observed the most marked and constant improvement. Sufferers from asthma and from hay-fever often have an

entire immunity here, but this is by no means always the case. Patients in the early stages of pulmonary phthisis usually do exceedingly well, —quite as well, according to my experience, as they do in the lowlands of the South,—always provided they persist with a rational treatment and can and will spend most of their time out of doors in the open air.

Chronic malarial cases may be cured by a long sojourn at Atlantic City. There is no doubt whatever as to the entire exemption of the place from malaria in the proper sense of that word,—*i.e.*, the miasm which produces ague or intermittent fever. The town has an excellent underground sewerage system,—one of the best on the coast,—and is supplied with an abundance of pure and wholesome drinking-water, so that invalids need not incur the dangers which lurk so often in resorts where the sanitation is bad.

ACTIONS OF DRUGS UPON THE KIDNEY.

ABSTRACT OF TWO LECTURES ON DIURETICS.

BY W. C. CALDWELL,

Professor of Materia Medica and Director of the Pharmacological Laboratory, College of Physicians and Surgeons, Chicago.

GENTLEMEN:—To-day I begin a consideration of a class of drugs called diuretics. These drugs, when given in medicinal doses, increase the activity of the kidneys, increase the secretion of the urine. They not only act upon the kidneys, but also on other organs, and for convenience I will speak first of their action as diuretics, and then afterwards consider each drug separately, giving its composition, pharmaceutical preparations, and other actions. I shall not be content with simply telling you that these drugs increase the flow of urine, but will also, as far as is known, try to explain their mode of action, the different points in the renal mechanism where they act to increase diuresis. While it is true that a large number of pharmacological experiments have been made on the kidney, yet there is comparatively little known about how drugs act on it,—far less than there is about the action of drugs on the motor, respiratory, circulatory, and digestive mechanisms. At present there are many points unsettled, many experiments conflicting, so something I may say later research may prove to be different.

To make myself better understood, I will present the subject in the following order:

1. The action of drugs on the secretion of urine in health.
2. The action of drugs on the reaction of the urine in health.
3. The action of drugs on the composition of the urine in health.
4. The action of drugs on the secretion, reaction, and composition of the urine in disease.

ON SECRETION OF URINE IN HEALTH.

Before the student can understand the various ways that diuretics act, the various points that the different drugs stimulate or depress to increase the secretion of urine, he must first learn the parts of mechanism and their function; hence I will briefly describe,—

1. The anatomy of the renal mechanism.
2. The physiology of the renal mechanism.
3. The pharmacology of the renal mechanism.

The Anatomy of the Renal Mechanism.

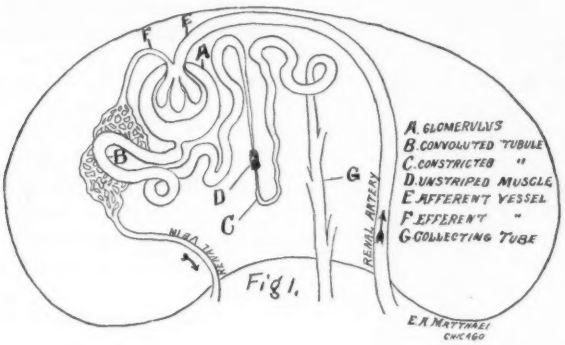
This mechanism consists of thousands of peculiar glandular structures bound together, and known collectively as the kidney. A complicated nervous mechanism presides over their functional activity. The glandular mechanism as shown in the simple schematic drawing No. 1, where, for simplicity, only one of these structures is represented, is composed of the following five structures: glomeruli, convoluted tubules, constricted tubules, unstriped muscles, and blood-vessels.

1. *The Glomeruli.*—These are situated in the cortex of the kidney, and each consists of a plexus of capillary vessels pushed into the closed capsule, which capsule is the dilated end of the corresponding convoluted tubule. Hence, as shown in Diagram 2, the capsule of the glomerulus consists of two layers, the cavity between which opens into the convoluted tubule. Also notice that the layer covering the capillary plexus is made of cubical cells, while the external layer is formed of flattened cells. This has, as will appear later, an important bearing on the function of the glomerulus.

2. *The Convoluted Tubules.*—These tubules, as shown in Diagram 1, arise from the capsule and pursue a tortuous course, and end in the constricted loops to be described next. They are lined with a single layer of nucleated polyhedral epithelium, as shown in Diagram 3.

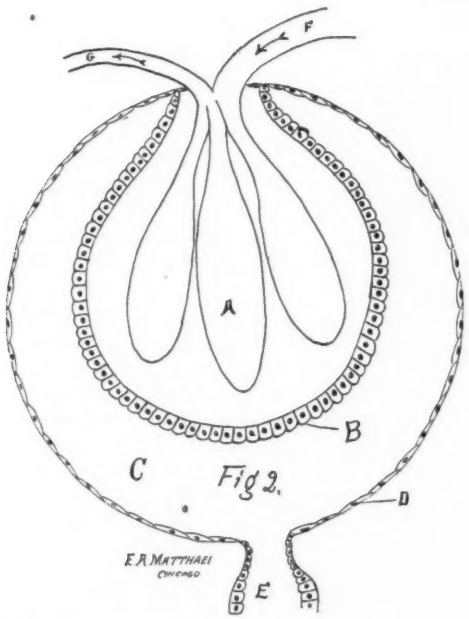
3. *The Constricted Tubules.*—These tubules, as seen in Diagrams 1 and 3, are situated in the medullary portion of the kidney, have a much smaller lumen than the convoluted tubules, and are lined with a single layer of flattened epithelium. Notice the difference in the cells of these two different kinds of tubules.

4. The Unstriped Muscles.—As shown in Diagram 1, there are unstriped muscle-fibres around the constricted loops. Also, in Diagram 4, copied from Kostjurin, they are shown as they appear under the microscope. These fibres are found throughout the kidney, but the only ones that at this place concern us are those around these loops.



5. The Blood-Vessels.—As seen in Diagram 1, the afferent vessels convey the blood to the glomeruli; then it passes out by the efferent vessels, and is carried by them to the convoluted tubules. The blood passes through the glomeruli first, then to the tubules. There is an insignificant portion that does not pass through the glomeruli. The nervous mechanism probably, as shown in Diagram 5, consists of,—

1. Four centres in the medulla oblongata,—the vaso-constrictor, vaso-dilator, secretory, and inhibitory secretory.



2. Four sets of fibres passing respectively from these centres by way of the solar and renal plexuses to the kidney.

These nerves, after reaching the kidney, pass to the structures suggested by their names. The vaso-constrictor and vaso-dilator enter the vessel walls. Berkley has shown that they do not enter the capsule and pass to the capillary plexus of the glomerulus. The secretory nerves pass between the epithelial cells of the convoluted tubules. As yet no nerves have been found supplying

the cubical epithelium over the capillary plexus. The recent researches of Berkley in the Patho-

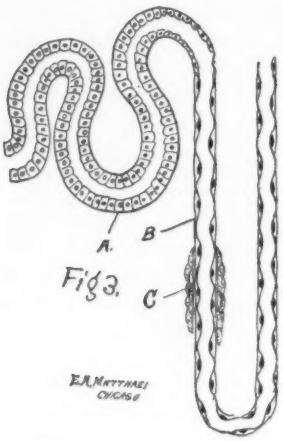
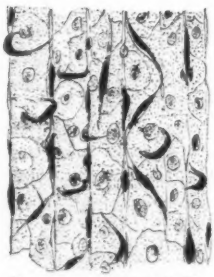


Fig 3.

logical Laboratory of Johns Hopkins Hospital have shown the terminations of the renal nerves


Copied from a sketch of Prof S.D. Kostjurin
Matthaei Fig 4.

as stated above. However, it must not be forgotten that a number of experimenters deny the existence of secretory nerves for the kidney.

The Physiology of the Renal Mechanism.

The functions of the different parts of the renal mechanism may be briefly stated as follows:

1. The glomeruli excrete water and mineral salts and also certain pathological substances and some foreign materials that have been introduced into the circulation. As the blood circulates through the capillary plexus of the glomerulus, these substances *osmose*, not filtrate, into the capsule cavity, and then pass on into the convoluted tubules. The cubical epithelium, as shown in Diagram 2, excretes these substances by an exosmotic action.

2. The glandular epithelium of the convoluted tubules excretes some water, but mainly the retrograde products, such as urea. In the evolution of these structures the glomerulus was placed above the convoluted tubule, very likely so that the water could wash the urea out of the tubules into the pelvis of the kidney.

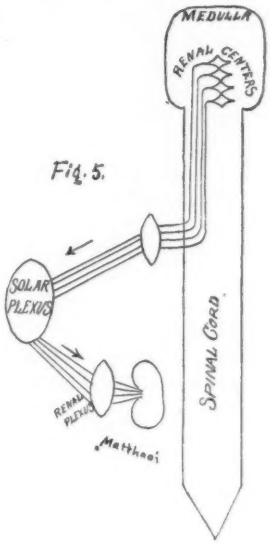


Fig. 5.

3. The constricted tubules regulate the amount of urine by their constrictions delaying its exit and permitting some of the water to be reabsorbed. It is probable that the contraction of the unstriped muscle-fibres around the tubules can not only hasten the expulsion of urine by their peristalsis, but also that under certain circumstances they may lessen or increase the size of the constricted loops and affect the quantity of water passing outward.

4. The nervous mechanism regulates the functional activity of the kidney by controlling the blood-supply to the gland, by regulating the activity of the secreting cells, and possibly by acting upon the unstriped muscles around the tubules. It is very probable that these unstriped muscles are supplied with nerves. No experiments have been made with regard to whether drugs acting upon unstriped muscles can in this way affect diuresis.

The Pharmacology of the Renal Mechanism.

In presenting this I will,—

1. Enumerate the various points where a drug may act;

2. Describe the possible ways in which drugs may increase the secretion; and,

3. Give the experimental methods of determining the points where a drug acts to increase the secretion of urine.

I. The Various Points in Mechanism.

The conceivable points in the mechanism where drugs may act to increase the secretion of urine, as seen in Diagram 5, are,—

1. The four centres in the medulla oblongata.
2. The solar or renal plexus.
3. The ends of the various nerves in the kidney.
4. The muscle of the vessel wall.
5. The renal glandular cells. Or, putting this more in detail, remember that,—
1. Stimulation of the vaso-constrictor centre will contract renal vessels and diminish secretion.
2. Depression of the vaso-constrictor centre will dilate renal vessels and increase secretion.
3. Stimulation of the vaso-dilator centre will dilate renal vessels and increase secretion.
4. Depression of the vaso-dilator centre will contract vessels and diminish secretion.
5. Stimulation of the secretory centre will increase glandular activity and the secretion.
6. Depression of the secretory centre will diminish glandular activity and the secretion.
7. Stimulation of the inhibitory secretory centre will diminish glandular activity and secretion.
8. Depression of the inhibitory secretory centre will increase glandular activity and secretion.

The same eight propositions can be formulated for the ends of the nerves as for the centres.

9. Direct stimulation of the arteriole wall in the renal vessels will contract the arteries and lessen secretion.
10. Direct depression of the arteriole wall in the renal vessels will dilate the arteries and increase secretion.
11. Direct stimulation of the glandular cells will increase secretion.
12. Direct depression of the glandular cells will lessen secretion.

II. Possible Ways in which Drugs may act.

There are just three ways by which the secretion of urine may be increased:

1. By increasing the renal blood-pressure and circulation.
2. By increasing glandular activity in other ways than through blood-supply.
3. By lessening reabsorption from the constricted loops.

Action on Circulation.

I will speak of the glomerular circulation first, and then afterwards of that of the convoluted tubules. Because the glomeruli are specially constructed for the secretion of water, and the convoluted tubules for the secretion of retrograde products, the *circulatory apparatus* in the glomerulus is the higher developed, while the *secretory cells* in the convoluted tubule are the higher developed. Hence drugs, by acting on the circulation of the glomerulus, will affect its secretion far more than drugs acting on the circulation of the convoluted tubules will affect its secretion. For this reason much more must be said about the action of drugs on the circulation of the glomerulus than upon the circulation of the convoluted tubule.

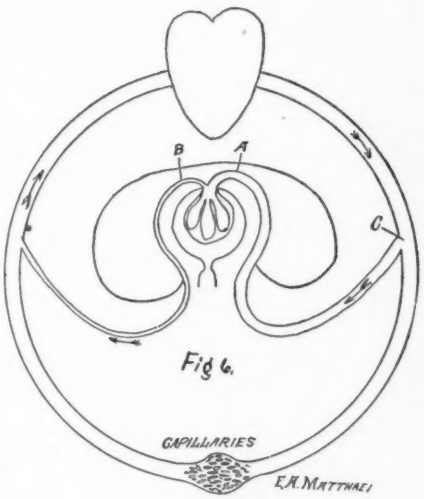


Fig 6.

The glomerular circulation and blood-pressure may be increased, as shown in Diagram 6, in three ways: (*a*) by dilating the afferent vessels, (*b*) by contracting the efferent vessels, and (*c*) by raising the general blood-pressure.

It is conceivable that the afferent vessels may be dilated,—

1. By stimulating the vaso-dilator apparatus.
2. By depressing the vaso-constrictor apparatus.

This action may be in the medulla oblongata, or solar or renal plexus, or on the ends of the nerves distributed to these vessels. In one or more of these ways the nitrites and alcohol (see Diagram 7) dilate the afferent vessels and increase the secretion of urine.

It is also conceivable that the efferent vessels may be contracted,—

1. By depressing the vaso-dilator apparatus.
2. By stimulating the vaso-constrictor apparatus.

This action also may be in the medulla oblongata, solar or renal plexus, or on the ends

of the nerves distributed to the efferent vessels. Numerous experiments appear to show that digitalis, squill, sparteine, convallaria, strychnine, and erythrophleum stimulate the vaso-constrictor centre in the medulla, causing the efferent vessels to contract, raising the blood-pressure in glomeruli, and increasing secretion of urine. This is seen in Diagram 7. Sehrwald says that digitalis and strychnine also stimulate the ends of the vaso-constrictors. Broom, buchu, uva ursi, juniper, turpentine, copaiba, and cantharides are said to contract the efferent vessels, probably by stimulating the ends of the vaso-constrictor nerves in the vessel wall, and in that way act as diuretics. In conclusion, remember that while dilatation of the afferent vessels increases the secretion of urine, if the dilatation be excessive the secretion may be suppressed. When an excessive quantity of blood enters the capillaries of the glomerulus, the two layers of the capsule, as seen

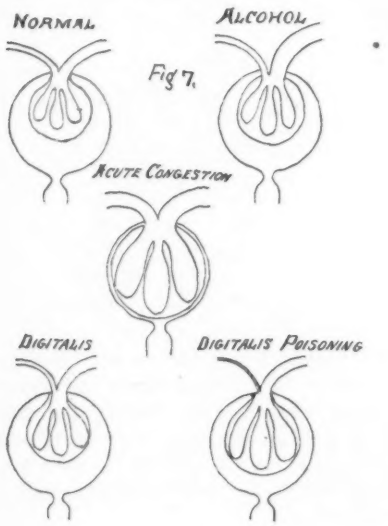


Fig 7.

in Diagram 7, become greatly distended and probably pressed closely together, so that there is no space for the urine to osmose into. This is what occurs in the ischuria of acute renal congestion. Again, while contracting the efferent vessels raises glomerular blood-pressure and increases secretion, yet, if it is excessive, the secretion will be lessened or even entirely suppressed, because the circulation in the glomerulus stops. This is the way, in digitalis-poisoning (see Diagram 7), the urine is suppressed.

The systemic blood-pressure may be increased,—

1. By increasing the pumping power of the heart.

2. By contracting the arterioles of the body. If at the same time the renal arterioles are contracted, this action diminishes secretion. Caffeine would be a stronger diuretic if at the same time it raises the blood-pressure it did not contract the renal arterioles. Such drugs as digitalis, strophanthus, squills, sparteine, convallaria, strychnine, and erythrophleum raise the systemic blood-pressure, which increases their action as diuretics. Those drugs that are diuretic by raising the systemic blood-pressure have, of course, far more marked action when the blood-pressure is below normal, as occurs in valvular heart-disease and debility.

3. By increasing the quantity of water in the blood-current. This is the way the secretion is increased after drinking large quantities of water. When the subcutaneous cellular tissue or serous sacs contain large amounts of water, as occurs in œdema and ascites, iodide of potassium, by causing it to re-enter the blood-current, may act as a strong diuretic, although it has no specially marked action on the kidneys. All that need be said about the circulation in the tubules is, that, as with any other gland, increasing its blood-supply increases secretion.

Action on Secreting Cells.

I will next speak of the ways in which the secreting cells may be stimulated. I will consider first the cells of the convoluted tubules, and then afterwards say something about the cubical cells of the glomeruli. It is conceivable that the secreting cells of the tubules may be stimulated,—

1. By the drug acting directly on the cells, possibly during its excretion from the body. No very elaborate experiments have been made on this subject. It may be in this way that the lithium, potassium, and sodium salts act. It is believed by some that calomel and other salts of mercury act in this way, and in proof of this they refer to the irritation, the cloudy swelling, of these cells in poisoning with mercury. They think that it increases renal activity just as it is supposed to stimulate the flow of saliva,—that is, during its elimination by the salivary and buccal glands. It might be remarked that Noel-Paton suggests that calomel acts as a diuretic by increasing the formation of urea in the liver, and that the urea acts as the diuretic. Lactose and glucose are believed to increase the secretion by acting directly on the secreting cells.

2. By stimulating the ends of the secretory nerves distributed to the cells. It may be that this is the way urea, diuretin, and one action

of caffeine excite secretion. However, some think they act directly on the cells.

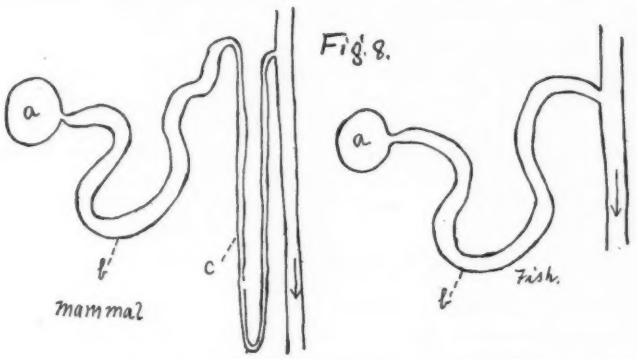
3. By stimulating the secreting centre, or else the solar or renal plexus. If the recent researches of Cohnstein are correct, this is the way mercury, silver, and platinum act.

I will now say something about the action of drugs upon the cubical epithelium of the inner layer of the capsule of the glomerulus. What can be said here is almost speculative, yet the physical chemical researches of Hoppe-Seyler on the osmotic relations of blood and urine, and the recent experimental research on rabbits and cats by Dreser in the Institute of Physiological Chemistry at Tübingen, throw new light upon the function of the cubical epithelium of the glomerulus and the action of drugs upon it. His experiments make it very probable that the cubical epithelium is an osmotic membrane. Increased blood-pressure in the glomerulus increases the outflow of water, not because it is a filtration, but because the pressure increases the capillary surface for the outward passage of the water, and especially because it *increases the circulation, and hence the blood is more rapidly changed* in the capillaries, so that the osmosis in this way is increased. Dreser concludes from his experiments that it is possible for drugs to act upon this osmotic membrane,—that is, the cubical epithelium,—and in that way increase the exosmosis from the blood. He thinks that caffeine and diuretin act this way. Of course, the effect would be the same whether they acted directly on the cells or on the ends of the secretory nerves distributed to them. But it must not be forgotten that no nerves have as yet been found inside the glomerulus.

Action on Constricted Loops.

The comparative anatomical researches of Hüfner show that the constricted loops (Henle's loops) have the important function of causing the reabsorption of the water, as a means of regulating the amount of water in the blood. Mammals and birds living in the air, and being subject to irregular removal of water by the skin and bowels and lack of regular supply to drink, need such a mechanism to regulate the removal of water in the urine. Hence mammals and birds have these long, constricted loops for that purpose, as shown in Diagram 8. But the fish which live in the water, and are not subject to excessive loss of water, do not require any such regulating mechanism, and, as seen in diagram, they have no constricted loops. Dreser, from his experiments on rabbits, thinks that the first action in calomel diuresis is due to the mercury paralyzing these loops, so that reabsorption is lessened. He does not explain how it is supposed to act. He thinks that diuretics may yet be discovered that will not affect the glomeruli, but will act entirely by paralyzing these loops. The reabsorption of the water might be lessened by acting on the epithelium, so that it could not so easily or rapidly osmose back into the blood, or by dilating the constrictions so that the water could pass on more rapidly before there was time for its reabsorption. These might be dilated by relaxation of the unstriped muscles which, Kostjurin has pointed out, surround these tubes.

Fig. 8.



No experiments whatever have been made to determine if drugs can act in this way as diuretics.

Again let me repeat that part that I have said may not be true, but it will serve its purpose if it suggests to you the importance of such knowledge,—the clinical value of knowing where a diuretic acts, and the possible lines for future research on the mode of action of diuretics.

III. Methods of Experimental Research on the Actions of Drugs as Diuretics.

I will next speak of the methods used for determining the points where a drug may act to

increase urinary secretion. It must be kept in mind that a drug may have more than one action, that it may act at more than one point in the renal mechanism, also that these actions may synergize,—that is, act together to increase diuresis,—or they may antagonize, one increasing while the other is diminishing the secretion. As an example of synergistic action may be mentioned alcohol, which raises the arterial pressure and also dilates the afferent vessels. Of antagonistic actions may be mentioned caffeine, which stimulates the convoluted tubules and increases secretion, but at the same time contracts the afferent vessels and proportionately lessens the secretion. In presenting these methods of research, since the subject is so complicated, I will, for simplicity, assume that the drugs have only one action upon the kidney.

The simplest and most common method used by experimenters is to find out, first, whether the drug acts by raising the arterial pressure. To do this all that is necessary is to introduce a manometer into the carotid artery, and record the blood-pressure before and after giving the drug. If the pressure is raised, it is concluded that the diuresis is probably due to increased blood-pressure; if it remains unchanged, then it probably acts on the secreting cells. This was the method used by Cohnstein in experimenting with diuretin on rabbits and cats. In diuretic doses the pulse and blood-pressure were unchanged; hence he thought it possible that the drug acted upon the secreting structures. But, as a means of giving you a general idea, rather than as a guide to experimental work, I will present this in a systematic manner. The order presented here will not always be practical to follow, but it will at least serve somewhat to give you an idea of how the actions of diuretics are learned. The experimenter may begin his work in several different ways. He may first decide whether the drug acts *inside* or *outside* of the kidney, or instead he may think it more convenient to determine first whether the drug acts on the *circulation* or on the *secreting cells*. I will very briefly outline both methods of procedure.

First Order of Procedure.

1. If the drug is a diuretic,—

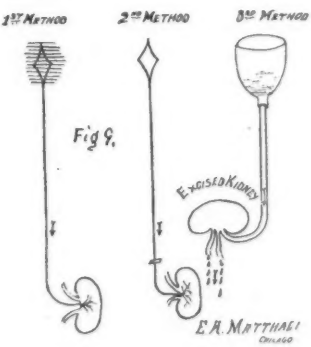
(1) It acts on some structure within the kidney, or

(2) It acts on some structure outside of the kidney.

In which of these ways it acts is determined as follows:

Demonstration.—First Method.—As shown in Diagram 9, completely paralyze the centres in the medulla with some drug like chloral; then, of course, drugs cannot stimulate this centre to produce diuresis. Then secure canulas in the ureters to collect urine for measuring. Measure urine for a certain number of minutes, then give the diuretic; if the secretion is increased now, when the centres in the medulla are paralyzed, the drug acts on some structure in the kidney. It is usually best to inject the drug into a vein, as it acts much quicker. But do not lose sight of the fact that the drug may have more than one action, and the other may be in the medulla oblongata. Schröder and Lanngaard used this method to show that caffeine acted on some structure in the kidney.

If the drug does not increase the secretion when these centres are paralyzed, then it is because it does not act in the kidney, but its diuretic action is due to stimulation of the medulla oblongata. This is one of the ways Cohnstein used to determine the action of mercury, silver, and platinum. He says in the chloralized rabbit these drugs will not excite secretion; therefore he concludes that they act in the medulla oblongata. His experiments need confirmation.



Second Method.—As shown in Diagram 9, cut one renal nerve, then the corresponding kidney will be shut off from outside influence. Secure a canula in each ureter to measure the urine from each kidney. Measure rate of secretion from each kidney, and then give the diuretic. If the drug stimulates the isolated kidney, it is by acting in the kidney; if it does not, it is because its action as a diuretic is outside of the kidney. In this way Schröder and Lanngaard showed that caffeine acted within the kidney. Cohnstein also used this method to show that mercury, silver, and platinum do not act in the kidney. Other experimenters do not agree with him. If the drug increases secretion from both kidneys, but in a greater quantity from the intact kidney, it shows that the action is both within and without the kidney.

Third Method.—As shown in Diagram 9, the kidney is excised and placed in an apparatus (not shown or described here) specially constructed to keep up proper pressure, temperature, and artificial circulation of blood-and-salt solution through canula in renal artery. Munk devised this apparatus some years ago. Recently Jacoby and Sobieranski, in the Pharmacological Institute in Marburg, have constructed an instrument for carrying on artificial circulation in the kidney, which they call a *hæmatizator.* After the kidney is placed in the apparatus and the circulation started, the rate of secretion of urine is next to be measured by taking it from canula in ureter; then add the drug to the liquid which is to pass through the kidney. If the secretion is increased, it shows that the drug acts in the kidney; if it is not increased, then it acts without the kidney. In this way it has been shown that chloride of sodium, nitrate of sodium, nitrate of potassium, caffeine, dextrose, cane-sugar, and glycerin stimulate secretion by acting within the kidney. Having now learned how to determine whether the action is in or outside the kidney, you will next study each of these.

2. If the drug acts inside the kidney to increase the secretion,—

(1) It dilates the renal arterioles; or

(2) It contracts the efferent vessels; or

(3) It stimulates the secreting cells.

The next thing to do is to determine in which of these ways it acts.

Demonstration.—Secure canula in one renal vein, as seen in Diagram 10, and measure rate of outflow from vein before and after giving the diuretic. If the venous flow is increased by the drug, the secretion is due (*a*) to dilatation of the renal arterioles; if it is diminished, the secretion is due (*b*) to contraction of the efferent vessels; and if it remains unchanged, the secretion is due (*c*) to action upon the secreting cells.

3. If the drug acts outside of the kidney to increase the secretion,—

(1) It raises the general blood-pressure; or

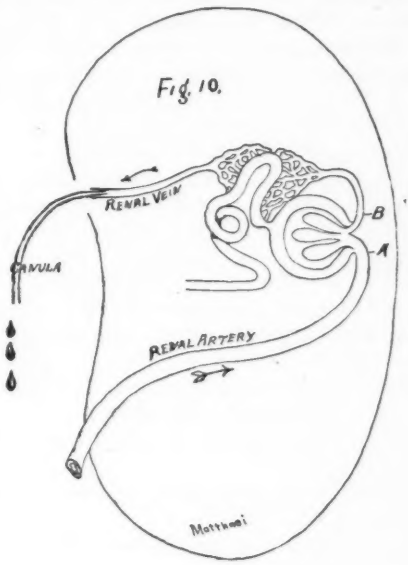
(2) It dilates the renal arterioles by acting in the medulla oblongata; or

(3) It contracts the efferent vessels of the glomeruli by acting in the medulla; or

(4) It stimulates the secretory cells by acting in the medulla oblongata.

The next thing is to determine in which of these four ways it acts.

Demonstration.—Introduce manometer in the carotid artery and canula in the ureter. Record blood-pressure before and after giving the diuretic. If the pressure is raised, then the drug acts as a diuretic, at least in this way. If the systemic blood-pressure remains unchanged, then the diuresis is produced in one of the other ways. Cohnstein used this method to



determine whether calomel increased secretion by raising blood-pressure or by acting on one of the centres in the medulla oblongata. Having excluded systemic blood-pressure, you will next determine which of the centres in the medulla oblongata it acts upon. This action on the medulla causes either the afferent vessels to dilate, the efferent to contract, or the secreting cells to become more active.

Demonstration.—Which of these three it acts upon is determined as previously described.

Second Order of Procedure.

1. If the drug is a diuretic,—

(1) It acts on the circulatory mechanism; or

(2) It acts on the secretory mechanism.

The next thing is to determine on which of these two mechanisms the drug acts.

Demonstration.—Secure canula in one of the renal veins, and measure rate of flow before and after giving the drug. The outflow of blood can be measured by counting the drops, or, more accurately, by the graphic method,—that is, by an electric marker that will record each drop. If the venous outflow remains unchanged, the action is on secretory mechanism; but if it is increased or diminished, the action is on circulatory mechanism. Having now learned how to determine on which of the two mechanisms it acts, you will next consider each separately.

2. If the drug is a diuretic, because it stimulates the secretory mechanism,—

(1) It acts upon the centre in the medulla; or

(2) It acts in the kidney on the secreting cells or ends of nerves distributed to them.

Demonstration.—Isolate kidney in the three ways already described and give the drug.

3. If it is a diuretic by acting upon the circulatory mechanism,—

(1) It dilates the renal arterioles; or

(2) It contracts the efferent vessels; or

(3) It raises the systemic blood-pressure.

Next determine in which of these three ways it acts.

Demonstration.—Measure blood-pressure, and if not changed by the diuretic, then it acts in one of the other two ways. Measure rate of flow through renal vein; if the drug increases it, the arterioles are dilated; if it decreases it, the efferent vessels are contracted.

4. If it is a diuretic by dilating the renal arterioles,—

(1) It acts in the kidney to produce this dilatation; or

(2) It acts in the medulla oblongata (probably).

Next determine this.

Demonstration.—This may be determined in one of three ways,—by completely paralyzing the vaso-motor centres in the medulla oblongata, or by cutting the renal nerves, or by using the excised kidney. If in either of these three experiments the drug stimulates secretion, it is by acting in the kidney.

5. If the drug is a diuretic by contracting the efferent vessels,—

(1) It acts upon them in the kidney; or

(2) It acts upon the centre in the medulla.

Demonstration same as the last.

6. If the drug is a diuretic by raising the systemic blood-pressure,—

(1) It increases the pumping power of the heart; or

(2) It contracts the systemic arterioles.

Demonstration.—Secure canula in the peripheral end of femoral vein. Observe rate of outflow before and after the drug is given. If the flow is lessened, the arterioles are contracted; if increased, the heart is stimulated; if unchanged, or very slightly, probably both the heart and arterioles are acted upon.

On Reaction of Urine in Health.

In health the acidity of the urine is due mainly to acid phosphate of sodium, or, if there has been an excessive meat diet, to acid phosphate of potassium. The acid phosphate is formed from the basic phosphate during its exosmosis from the blood through the renal cells. This occurs because the nature of the epithelium is such that in health the acid is drawn through more rapidly than the base, and hence the decomposition and formation of the acid phosphate, of acid urine from alkaline blood. It is a well-recognized physical fact that osmotic force can cause chemical decomposition.

The reaction of the urine can be changed in two ways,—

1. By changing the reaction of the blood; and,

2. By affecting the activity of the renal mechanism.

Action on Blood.

Before speaking of how to change the reaction of the blood and in that way the reaction of the urine, I will say something about how the reaction of the urine is affected by that of the blood. Since the urine is formed from the blood, it is natural to suppose that the more alkali in the blood the more tendency there would be for it to appear in the urine, and this is the case. Normally, the renal epithelium is capable of converting the basic into acid salt; but if there is too much, then it no longer is capable of doing this, and hence the reaction of the urine may become alkaline.

The reaction of the blood may be changed by removing or adding acids to it and by removing or adding alkalies to it.

The blood may be made more alkaline,—

1. By adding alkalies to it. Hence the hydrates and carbonates of sodium, potassium, and lithium increase its alkalinity; also the vegetable salts of these alkalies, since in the blood they become oxidized into the carbonates.

2. By removing or preventing the normal entrance of acids into the blood. During digestion there is a large quantity of hydrochloric acid secreted in the stomach, the removal of which from the blood just so much alkalinizes it, because the sodium with which it was combined as a neutral salt in the blood is now acting as an alkali. The precipitation and consequent prevention of the acids in the food being absorbed and entering the blood will increase the alkalinity of the blood. This is specially true of phosphoric acid, which forms insoluble salts with calcium and magnesium; hence if at meal-time lime or magnesia be given, it will precipitate and prevent the phosphoric acid of the food entering the blood, and of course will increase the alkalinity of the blood. Vegetable food increases the alkalinity of the blood in both these ways. It contains more sodium and potassium than animal food, and hence adds

more alkalies to the blood; it also contains more lime and magnesia, hence prevents the phosphoric acid entering the blood. This is the reason carnivora have acid and herbivora alkaline urine.

The blood may be made less alkaline,—

1. By adding acids to it. This occurs when large quantities of the mineral acids, except nitric, well diluted with water, are given; also, to a less extent, when the vegetable acids are taken. Salicylic, and especially benzoic, acids are about the only ones used for this purpose. There is nothing known about lessening the alkalinity of the blood by removing the alkalies from it, or by precipitating them in the digestive tract so that they will not enter the blood. But the alkalinity can be lessened by using a meat diet, which contains less alkalies.

Action on Renal Mechanism.

Just as it has been known for years that adding an alkali or acid to a solution changes its reaction, so it has been known that giving acids or alkalies will affect the reaction of the urine; but it is only recently that it has been learned that the reaction can be changed in an entirely different way,—that is, without any regard to the chemical law just mentioned. This action is not dependent on whether the drug is acid, alkaline, or neutral. When the diuresis is increased, when a large quantity of water is excreted, the urine becomes less acid, or may even become alkaline. The greater the quantity of water excreted the more nearly the reaction approaches that of the blood; hence drugs that increase glomerular activity lessen the acidity of the urine. It would seem that the basic phosphate, when it exosmoses with a large quantity of water, is not so easily decomposed into the acid phosphate as occurs in the normal secretion. Riedel, in the Pharmacological Institute in Heidelberg, experimented with rabbits and dogs as to the influence of diuresis on the reaction of the urine. In order to exclude the influence of digestion he withheld food from them for several hours before the experiments. He withheld the food from the rabbits nineteen hours or more, so that the urine would become acid before he began the experiment. He found that neutral salts, like sodium chloride, sodium sulphate, sodium nitrate, also theobromine and sugar, caused the acid urine to become neutral, then later alkaline, and again acid, as the effect of the drug wore away.

ON COMPOSITION OF THE URINE.

I. Drugs contracting the Efferent Vessels.—This action causes the following to occur:

1. Less blood passes through the kidney.
2. Hence less urea is excreted.
3. More water is excreted by the glomeruli because the glomerular pressure is raised. Therefore these drugs diminish urea and increase the water.

II. Drugs dilating the Afferent Vessels.—This action causes the following to occur:

1. More blood passes through the kidney.
2. Hence more urea is excreted.
3. More water is excreted by the glomeruli because the glomerular pressure and circulation is increased. Therefore these drugs greatly increase the water and slightly the urea.

III. Drugs stimulating the Convoluted Tubules.—This action causes the following to occur:

1. Same amount of blood passes through the kidneys.
2. Far more urea and slightly more water by the convoluted tubules.
3. The same amount of water is excreted by the glomeruli. Therefore these drugs slightly increase the water and greatly increase the urea.

IV. Drugs paralyzing the Constricted Loops.—Nothing is known about this, but if a drug should be found to act solely in this way, it is probable that the following would occur:

1. Same amount of blood would pass through the kidneys.
2. Same amount of urea would be excreted.
3. Same amount of water would be excreted.
4. Little water would be reabsorbed. Therefore such a drug would increase the water, while the urea would remain the same.

ACTION OF DIURETICS IN DISEASE.

On first thought it might be supposed that diuretics would be used mainly in the treatment of disease of the kidneys, but they are rarely used for this purpose. When in nephritis the function of the kidneys is compromised, causing symptoms from the accumulation of waste in the body, diuretics given to stimulate the diseased kidneys, as a rule, will increase the trouble. It is usually best to try to make the skin and intestines do the work of the crippled kidneys for the time being. Sometimes, though, the alkaline diuretics may be of service, because, instead of determining blood to the kidneys, they may simply deplete the kidneys by increasing outward osmosis through the secreting cells, and in that way remove the waste from the blood without doing the kidneys any harm. But if there is extensive injury of the renal structure, you cannot expect any diuretic

to increase the secretion. There are, however, pathological conditions in other organs where diuretics may often be of great service. These conditions are different, sometimes directly opposite; hence to be of service in a certain condition it is not sufficient that the drug simply increase the flow of urine, but it must do this in a certain way. So you see the advantage of knowing the exact points in the mechanism where the drug acts in order to select the proper diuretic upon a rational basis. Aside from their limited use in the treatment of disease of the kidneys, diuretics are indicated in the treatment of the six following pathological conditions:

1. To remove Excessive Accumulations of Water in the Body when the Blood-Pressure is too Low.—In cardiac insufficiency there is low arterial and high venous pressure, and, as a consequence, there is not only dropsy, but lessening of the urine because of the low blood-pressure. The diuretics to select here to increase the urine are those that raise the blood-pressure by increasing the pumping power of the heart. These drugs are of great service, because this action on the heart not only increases the urine and removes the dropsical effusion, but at the same time prevents the further accumulation of effusion. Digitalis, strophanthus, and squill render prompt service in this condition. A diuretic which acted only on the kidney without being combined with one which increased the action of the heart would not be of much service, and one which lowered the blood-pressure would do great harm. Sometimes it may be advantageous to combine other diuretics with such drugs as digitalis to hasten the removal of the water from the tissues. Greater secretion will result if diuretics acting at different points are used together:

(1) Digitalis to raise systemic blood-pressure.

(2) Broom to contract the efferent vessels of the kidney.

(3) Sweet spirit of nitre to dilate the afferent vessels of the kidney.

(4) Acetate of potassium to stimulate the convoluted tubules.

2. To remove Excessive Accumulations of Water in the Tissues which is not Due to Low Arterial Pressure.—In this condition diuretics are of nothing like the service they are in heart-disease. In hepatic cirrhosis the passage of the portal blood through the liver is obstructed, and, as a result, there is leakage from the distended portal vessels into the peritoneal cavity. If diuretics are used to remove this, it is not so important that they raise the arterial pressure, as is the case in heart-disease. A diuretic is wanted that causes a large quantity of water to be secreted regardless of its effect upon the blood-pressure.

But hydragogue cathartics are far more efficient than diuretics, because they lower the abnormally high portal pressure and stop the outward passage of the water into the peritoneal cavity.

3. To remove Water from the Blood when the Arterial Pressure is too High.—At the onset of many acute diseases, as tonsillitis, bronchitis, etc., there is high arterial tension, which hastens the extension of the disease. This high pressure may be lowered by diuretics, which, by draining a large quantity of water from the blood, lower the pressure. It is evident that such diuretics as raise the arterial pressure will do harm by still further increasing the high pressure. For this purpose it is best to select a diuretic—

(1) That will greatly increase the secretion of water, either by dilating the afferent or contracting the efferent vessels of the kidney.

(2) That will lower the systemic blood-pressure.

(3) That will at the same time produce marked diaphoresis.

Because sweet spirit of nitre dilates the systemic arterioles, causes diaphoresis, and increases the secretion of urine by dilating the afferent vessels of the kidney, it is often used with benefit during the first hours of acute sthenic fevers.

4. To remove Waste from the Body.—Sometimes in disease there is excessive production of waste. This occurs in rheumatism, gout, uric-acid diathesis, and in many acute diseases. For this purpose those diuretics which stimulate the convoluted tubules and increase the secretion of waste products are indicated. They are of still more service if at the same time while circulating in the blood they increase oxidation and burn up this pathological material; hence the alkalies—lithium and potassium—are of service here because they increase oxidation as well as hasten the removal of waste by the kidneys.

5. To lessen the Acidity of the Urine.—In debility and other conditions sometimes the urine is excessively acid, and, as a result, there is frequent micturition from the irritation. In the uric-acid diathesis there may be irritation from the uric-acid crystals. Or, again, the urine may not be too acid, but the urinary tract may be inflamed, as occurs in gonorrhœa, so that the normal urine causes irritation. For all these cases the alkaline diuretics are of service.

6. To increase the Acidity of the Urine.—In cystitis and other affections there is sometimes ammoniacal decomposition of urine, which, by its irritation, causes frequent painful micturition. For this purpose benzoic acid, salol, and other salts of salicylic acid are used.

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THE ADVANTAGES OF AMORPHOUS PHOSPHORUS OVER THE OFFICIAL FORM.

BY E. Q. THORNTON, M.D.,
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THE investigations of Wegner, Bradley, Broadbent, Thompson, and others should leave little doubt as to the value of phosphorus as a stimulant to bone-growth and in the treatment of disorders due to exhaustion or wasting of the nervous tissues. The remedy, while undoubtedly possessing power potent for good, has the great disadvantage of not being entirely safe, as disorders of digestion, nephritis, and fatty degeneration are not infrequently attributed to its administration. On account of these untoward effects many authors have wisely insisted upon the utmost precaution in its use. As is well known, the form of phosphorus exclusively employed in medicine is the vitreous variety, from which both of the official preparations are made. Both of these preparations are open to the objections named above, and on account of the readiness of phosphorus to undergo change when exposed to the air, the pills are necessarily made by a complicated process which renders their extemporaneous manufacture difficult. As to phosphorated oil, the other official preparation, its taste is extremely nauseous, as may be inferred from its combination (phosphorus, ether, and oil).

It is on account of these disadvantages of the vitreous phosphorus that I am led to suggest the employment of the amorphous or red variety. The amorphous phosphorus is made by heating the vitreous variety to 250° C. in the absence of air, and possesses the following advantages over the official variety: It does not readily undergo change at ordinary temperatures; it is almost entirely without taste or odor, therefore it can readily be made into pills at a moment's notice; it is free from irritant or caustic effect, consequently it is far less liable to give rise to irritation or inflammation of the gastro-intestinal and genito-urinary tract; but its greatest advantage lies in the fact that it is non-toxic and therefore far safer.

That it has the same physiological effect as ordinary phosphorus seems to be proved beyond doubt by Kelly, who, while experimenting upon himself to determine if it was toxic, experienced the full physiological effects of vitreous phosphorus. The following brief extracts are made from Kelly's essay, which has never been published:

Experiment 1.—For the first three days $\frac{1}{10}$ grain of amorphous phosphorus was taken every two hours, nine doses being taken each day. On the fourth day each dose was increased to $\frac{2}{10}$ grain, and from the tenth until the twenty-fifth day $\frac{3}{10}$ grain every two hours, nine doses a day being taken.

Effect.—Mental excitement, headache, vertigo, priapism, nocturnal emissions of semen, followed about the twentieth day by nervous exhaustion.

Return to his normal healthy condition in about two weeks after discontinuing the drug.

Experiment 2.—About two weeks after completing Experiment 1 he again began taking amorphous phosphorus in doses of $\frac{1}{100}$ grain, increased on the fifth day to $\frac{2}{100}$, and on the tenth day to $\frac{4}{100}$ grain, nine doses being taken each day.

Priapism and nocturnal seminal emissions were among the most pronounced effects. The drug was discontinued on the seventeenth day, and he soon returned to his normal condition.

Experiment 3.—About six weeks after completing Experiment 2 he took at a single dose 20 grains of amorphous phosphorus. The physiological effects came on promptly. Priapism, vertigo, nausea, followed by muscular tremors, cold, clammy skin, great exhaustion, and the most pronounced effects. For some weeks he was in a state of nervous exhaustion, from which he gradually returned to his normal

condition. He is now in good health and shows no ill effect of this rather vigorous medication.

Beese publishes a case in which 30 grains of amorphous phosphorus were taken by a young woman with suicidal intent, no toxic symptoms having been manifested!

My own experiments upon animals are in accord with those who assert that the substance in large quantities is non-toxic. My investigations as to the effect of long-continued doses is as yet incomplete.

These records would seem to indicate that amorphous phosphorus, while having the same physiological action as the vitreous variety, is to be preferred, as it is much easier to administer, less irritating, and, above all, is a far safer remedy.

THE USE OF SUBCONJUNCTIVAL INJECTIONS OF MERCURIC BICHLORIDE IN VARIOUS OCULAR AFFECTIONS, WITH A REPORT OF FIFTEEN CASES SO TREATED.

READ BEFORE THE PHILADELPHIA COUNTY MEDICAL SOCIETY, DECEMBER 27, 1893.

BY C. A. VEASEY, M.D.,

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DURING the past two or three years much has been written concerning the subconjunctival injections of antiseptic solutions in various affections of the eye, especially by French surgeons, who are the strongest advocates of the method.

It is by no means a new procedure, for, as early as 1866, Rothmund* used a solution of sodium chloride in this manner for clearing up corneal opacities; and since this time, but more especially within the past four or five years, various surgeons have employed the method in the treatment of numerous ocular diseases.

Valude, the editor of the *Annales d' Oculistique*, in the early part of this year sent a communication to many oculists in different parts of the world, asking a number of questions in regard to the method, in order that proper conclusions could be formed by comparing the experiences of many.† The results of this inquiry have been recently published,† and the experience of the large majority of the French surgeons included therein is in favor of the method.

It is not the purpose of the present paper to discuss the theory of subconjunctival injections and the value of the different drugs that have been employed in making them. Those interested are referred to the articles by Darier, which were published in the *Archives d' Ophthalmologie*, 1891, p. 449, and in the *Annales d' Oculistique*, April, 1893; also to the clinical lecture of Dr. de Schweinitz in the THERAPEUTIC GAZETTE, June, 1893.

The manner of making the injections is as follows: The conjunctival cul-de-sac is thoroughly cleansed with a freshly-made saturated solution of boric acid or with a solution of bichloride of mercury (1 to 8000), a few drops of a four-per-cent. solution of cocaine are instilled, and as soon as anæsthesia is produced the lids are separated by an assistant, while with a pair of fixation forceps the conjunctiva is seized about eight millimetres from the corneal margin, lifted up, and, the needle of the syringe having been inserted, the desired amount is forced out. The injection is made by Darier with a Pravaz syringe, but an ordinary hypodermic syringe, with a platinum needle, will answer the purpose very well. It is of the utmost importance, to be sure, that the barrel of the syringe be made thoroughly aseptic by the use of a strong solution of sublimate or carbolic acid; the needle should be brought to a red heat in the flame of an alcohol lamp prior to each injection, for a similar purpose. In fact, all the precautions against infection are taken just as if a corneal section were to be made.

If this be done, the danger of serious complications is reduced to a minimum. Slight chemosis follows each injection, but soon passes away. Occasionally a small conjunctival blood-vessel is punctured, giving rise to a considerable hemorrhage, but, beyond the discoloration thus produced, the accident is of little consequence. The cases of keratitis, or hypopyon keratitis, that have been reported as following an injection must have been due more to the imperfect sterilization of the instruments than to the operation itself. I have never seen such a complication.

The frequency of the injections, as well as the dose, depends upon the severity of the case. The strength of the solution employed is 1 to 1000, and the amount of the first injection about two minims. Much more than two minims has been given at a single injection, and repeated daily. But it seems to be generally conceded that it is better to begin with small doses, frequently repeated, say every other day, and to increase gradually the quantity in-

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* *Klinische Monatsblätter für Augenheilkunde*, 1866, p. 171.

† *Annales d' Oculistique*, August, 1893, p. 145.

jected as the idiosyncrasies of the patient are ascertained and the severity of the affection demands.

As to the number of injections to be made before the treatment should be abandoned, in case no improvement is observed after the first two or three have been given, no fixed rule can be followed. Darier says it is useless to continue after ten injections have been made if some improvement has not been noticed. On the contrary, as many as fifty or sixty have been given in a single case, with improvement. But, generally, if any benefit will accrue from the use of this method, it will be noticeable after a few injections, and the length of time the treatment should be continued depends upon the progress of the case, each being a law unto itself.

The cases in which the method has been employed by various observers are widely different, but all surgeons seem to agree that it should not be used when there is present any vascular stasis sufficient to prevent the quick absorption of the remedy. The replies to Valude's letter of inquiry indicate that the best results are obtained in diseases of the uveal tract, chronic in nature, though there are also reports of excellent results having been obtained in diseases affecting other portions of the eye.

The following cases, reported by request of Dr. de Schweinitz, represent the diseases which have received the treatment in his service in the Jefferson Medical College Hospital:

Case I.—*Scleritis.*—B. S., female, aged forty-three, housekeeper, presented herself at the eye dispensary with a well-marked scleritis in the left eye. There were two large patches of infiltration, one above and one to the outer side of the cornea. The ciliary pain was intense and the cornea somewhat thickened. No history of syphilis or rheumatism. The vision of the right eye equalled $\frac{20}{20}$; of the left, $\frac{20}{100}$. After using both local and constitutional treatment for some time without any benefit, we had recourse to the subconjunctival injections of sublimate.

On the 28th of April 1½ minims were injected just above the cornea and near the patch of infiltration. On May 1, three days later, the pain had entirely disappeared, the bulbar injection was almost gone, and the two patches of infiltration were much smaller. On this day an injection was made below the cornea. The patient did not return until May 12, saying she had felt so well she had thought it unnecessary to come earlier. There still being a little bulbar inflammation, however, a third injection was given, this time amounting to 2 minims. On May 20 the patient was to all appearances rid of the attack, and was dismissed from further attendance. Her vision on this date was for O. D., $\frac{20}{20}$; for O. S., $\frac{20}{30}$.

Case II.—*Syphilitic Serous Iritis* (*Keratitis Punctata*).—F. M., male, aged nineteen, morocco-worker; had an attack of gonorrhœa nine months before he presented himself for ocular treatment, followed a month later by a hard chancre. The ocular disease dates from this time. Treatment had been received during his first attack for three and a half months at another hospital. In each eye there were found traces of old iritic inflammation, and the corneas were infiltrated and hazy. Vision for O. D. equalled $\frac{20}{200}$; for O. S., $\frac{6}{200}$. On April 28 he was given an injection of sublimate beneath the conjunctiva, and between this time and August 14 he received fourteen injections. The vision on this date was for O. D., $\frac{20}{30}$; for O. S., $\frac{20}{200}$; a very great improvement.

Case III.—*Syphilitic Irido-Cyclitis.*—J. M., male, aged twenty-nine, driver, with well-marked irido-cyclitis in the right eye, of syphilitic origin, with a contracted pupil, pericorneal injection, intense pain, and numerous posterior synechiæ, presented himself for treatment on April 10. The usual treatment was given, including leeches to the temple; but on the 20th he did not seem to be any better. We then gave him an injection of sublimate, and on the 28th he was so much improved that another was given. On May 1, three days later, the ciliary inflammation was gone, the pupil round, and the vision, which before the treatment was for O. D. $\frac{20}{40}$ and for O. S. $\frac{20}{20}$, was now $\frac{20}{20}$ for each eye.

Case IV.—*Corneal Ulcers.*—M. E., male, aged thirteen, tobacco-stripper, came on March 23 to obtain treatment for recurring phlyctenular ulcers of the left eye. There was one large infiltrated ulcer in the lower inner quadrant of the cornea, with several smaller ones surrounding it. Large maculæ existed as sequelæ of former ulceration. He received the customary treatment, and the ulcers healed very sluggishly.

Having presented himself with a third attack, he was given three injections of sublimate at proper intervals, the injections being made in that portion of the conjunctiva nearest the ulcers. They healed about as quickly as with the ordinary treatment, the disturbance after each injection being such that considerable time had to elapse before another could be given. After the treatment his vision was the same as when he was first seen.

Case V.—*Syphilitic Plastic Iritis.*—M. J.,

male, aged thirty-five, coachman. Iritis in right eye of one week's duration. Intense ciliary injection, extreme tenderness, pupil small and immobile. There had been a papular eruption on his body some months before. His vision was for O. D., $\frac{20}{70}$; for O. S., $\frac{20}{30}$. One injection of sublimate was given, and on the following day the tenderness had disappeared, the ciliary injection was very much diminished, and the pupil was large and round. After this the patient was not again seen; so whether he continued to improve so rapidly that he thought it unnecessary to come to the dispensary again, or whether he became worse and applied elsewhere for treatment is only a matter of conjecture.

CASE VI.—*Syphilitic Plastic Iritis.*—A. P., female, aged fifty-two, housekeeper. Iritis in right eye of three weeks' duration. Vision for O. D., $\frac{20}{200}$; for O. S., $\frac{20}{70}$. Pupil small and slightly oval horizontally, but immobile. Initial lesion ten years ago. Same eye inflamed twice before. Patient was given two injections of sublimate, after which the inflammatory symptoms had subsided, but there remained a slight attachment of the iris below. One month later a similar inflammation developed in the left eye, but one injection completely dissipated it, leaving no synechia.

CASE VII.—*Non-specific Parenchymatous Keratitis.*—J. B., male, aged twenty-eight, machinist, presented himself for treatment with a well-developed inflammation in the left eye, characterized by diffuse infiltration in the parenchyma of the cornea. The vision of this eye has always been poor, but a change for the worse was noticed four weeks ago. Denies any specific history. After a fair trial of internal and local medication, with very little improvement, he was given, at proper intervals, sixteen injections of sublimate. At the time the treatment was commenced his vision was for O. D., $\frac{20}{40}$, partial, and for O. S., $\frac{20}{70}$. At the time of the last injection it was for O. D., $\frac{20}{40}$ and for O. S., $\frac{20}{30}$. The cornea of the left eye was comparatively clear. He had compound hypermetropic astigmatism, but the proper correction failed to make him see any lower on the test-card.

CASE VIII.—*Syphilitic Plastic Iritis.*—M. S., male, aged thirty, laborer. Iritis in right eye. Has had previous attacks. Patient is illiterate and a Russian, so it is impossible to obtain vision. One injection of sublimate reduced the inflammatory symptoms, leaving the pupil round and mobile.

CASE IX.—*Syphilitic Serous Iritis*—A. G., male, aged twenty-eight, laborer. Well-marked specific iritis, serous in type, in the right eye. There have been a number of previous attacks. Vision for O. D. is $\frac{20}{40}$ and for O. S., $\frac{20}{70}$. One injection was given, and two days later, when patient returned, the inflammation had subsided, the pupil was round, and the vision for each eye was $\frac{20}{20}$. Three months later this patient had another attack in the same eye, which was promptly checked by two injections.

CASE X.—*Interstitial Keratitis.*—F. A., male, aged twelve, presented himself with a most severe interstitial keratitis, of a scrofulous type, in both eyes. The lachrymation and photophobia were so great that it was impossible to measure his acuity of vision. He was given four injections of sublimate at differing intervals, his conjunctivitis being treated at the same time. At the expiration of this time—about two weeks—the patient left the hospital, but was much improved, readily counting fingers at twelve inches, both eyes being open and free from irritation, although no change in the corneal infiltration had occurred.

CASE XI.—*Interstitial Keratitis.*—P. L., female, aged seven. Has had badly-inflamed eyes since eight months of age, at which time there was present otitis media purulentia and a skin eruption covering almost the entire body. That peculiar variety of teeth to which Hutchinson's name has become attached is also present. The disease has been marked with frequent improvements and exacerbations. At the time the patient was first seen, the opaqueness of the cornea was so great that the pupils could scarcely be distinguished. Vision equalled the counting of fingers at six inches. In addition to the corneal inflammation there was a severe mucopurulent conjunctivitis and a chronic rhinitis. After the nasal and conjunctival inflammations had been somewhat reduced and internal medication had been employed, the vision became $\frac{20}{70}$ for each eye. Subconjunctival injections of bichloride were now tried at three different times, but the eyes became so much worse after each trial, the vision being reduced to $\frac{20}{200}$ for each eye, that this form of treatment had to be abandoned. Internal medication combined with local measures are now being used, and the patient is still improving.

CASE XII.—*Syphilitic Plastic Iritis.*—F. W., male, aged twenty-six, carpenter. Traces of old iritis in both eyes; now, a fresh attack in the left eye; initial lesion six months ago. Two injections of sublimate were sufficient to reduce the inflammatory symptoms.

CASE XIII.—*Scleritis.*—M. D., female, aged twenty-eight, housekeeper, presented herself for treatment of a severe scleritis of ten days' duration. Has had two previous attacks in the

same eye, the first six years ago, the second two and a half years ago. Each time the attack lasted for several weeks. Tension is —2; patient is pregnant. After employing the usual means of treatment for three weeks, with no improvement, an injection of sublimate was given. On the following day the inflammation had subsided considerably and there was less pain. The improvement continued for four days, when another injection was given; but the reaction from the last one was so great, and the eye suddenly became so much worse, that this plan of medication was abandoned.

CASE XIV.—*Gonorrhœal Iritis*—J. R., male, aged twenty-five. Two years ago had gonorrhœal iritis, following an arthritis of the knee and ankle of like origin, exceedingly stubborn in character, lasting for many weeks. Present attack (May 1, 1893) confined to the right eye, beginning five days before examination. Typical plastic iritis, associated with violent pain. Vision $\frac{5}{15}$, barely. Two injections of the sublimate solution given respectively May 1, 1893, and May 5, 1893. Twenty-four hours after the first injection, iris free and pupil round. One week after second injection, irritation entirely subsided; vision $\frac{5}{9}$.

CASE XV.—*Corneal Ulcer.*—J. K., male, aged sixty-one, presented himself for treatment May 15, 1893, with a large sloughing ulcer of the cornea in its lower portion and prolapse of the iris, the preserved portion of the anterior chamber being filled with blood and the bulbar conjunctiva swollen and œdematous; tension diminished; vision equals faint light perception. Atropine and boric acid ordered locally, and May 16, 1893, a subconjunctival injection of sublimate was given. Immediately afterwards intense pain and chemosis, which lasted for the rest of the day and during the night, and when he appeared the following day the eye was so swollen that the injection was not repeated. The ulcer was even more ragged and unhealthy than on the previous day. Under iodoform insufflations and a pressure bandage rapid healing took place.

To recapitulate, there were the following cases: 2 scleritis, 1 interstitial keratitis (scrofulous), 1 interstitial keratitis (specific), 1 parenchymatous keratitis (non-specific), 1 syphilitic irido-cyclitis, 2 syphilitic serous iritis, 4 syphilitic plastic iritis, 1 gonorrhœal iritis, 2 corneal ulcer.

In the two cases of scleritis the results in one were good, while in the other, after the first injection, they were negative.

In the interstitial keratitis of a scrofulous type the patient's condition was rapidly improving, but he discontinued the treatment.

In the specific interstitial keratitis the injections created such a disturbance that they had to be abandoned.

The case of non-specific parenchymatous keratitis was rapidly improved.

In the two cases of corneal ulceration, one was relieved of the inflammatory symptoms about as rapidly as with the ordinary method of treatment, while in the other the treatment was discontinued on account of the great degree of inflammation which followed the first injection.

In all the cases of iritis and in the case of irido-cyclitis the method gave prompt and effectual relief.

A solution of atropine was employed in each case from the beginning of the treatment; but in several of the cases of iritis it was used without result for several days, and on the day following an injection of sublimate, the synechiæ, as a rule, were broken and the pupils round.

125 NORTH SEVENTEENTH STREET.

A CASE OF VIOLENT BLEPHAROSPASM, WITH CURE.

Merz (*Klin. Monatsbl. f. Augenheilk.*, October, 1893) reports the case of a patient with violent cramp of the orbicular muscle, clonic in type, lasting from ten to twenty seconds at a time. The lid could then be opened, but there was quick repetition of the cramp. There was slight conjunctival catarrh and incipient cataract, with normal ophthalmoscopic appearances. There was contraction of the visual field for form and colors. Soothing local applications were of little moment, and the patient was given ichthyol internally, and ordered to wear a band around the brow composed of alternating strips of leather and metal. Some improvement followed this, but the marked and rapid cure of the case resulted after the injection of strychnia into the region of the supraorbital nerve, pressure on which temporarily stayed the spasmodic movements. In concluding, the author attributes only a very slight influence to the treatment by suggestion,—namely, the administration of ichthyol and the wearing of the band around the forehead. A definite improvement occurred only after the strychnine injections, and also in a very short time, and he believes that it was due to the effect of these upon the supraorbital nerves.

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Leading Articles.

THE TREATMENT OF GALL-STONE COLIC.

THE treatment of gall-stone colic, except so far as the administration of morphine by the hypodermic needle is concerned, is to a very great extent a bugbear to the practitioner of medicine. Yet the condition is one which demands that active measures for the relief of the attack which is present and the prevention of all future attacks should be instituted. Within the last few years a large number of writers in America and Europe have spoken in high praise of the employment of olive oil in large doses for the relief of an attack when once developed. Others have spoken equally enthusiastically of turpentine, and still others have recommended phosphate of sodium or Glauber's salt, both for the relief of the attack and for the prevention of subsequent illnesses. These remedies, of course, do not make up the entire list of drugs which have been employed in this aggravating condition, but may be considered, with perhaps the addition of potassium iodide and salicylate of sodium, as being those which have received the highest praise within recent years. In the *Manchester Medical Chronicle* for December, 1893, Dr. Brockbank has contributed a valuable and interesting article upon the pathology, etiology, and treatment of gall-stone, in which he considers the formation and composition of these stones as they occur in man and the lower animals, and calls attention to the fact that the disease is quite frequent among Anglo-Saxons, but very rare in Eastern countries. Thus, in the Royal Infirmary in Manchester an examination of the post-mortem records showed that gall-stones were found in nearly three per cent. of all the males and nearly eight per cent. of all the females on whom a post-mortem examination was made.

In order to determine what remedies could be used most rationally in this condition, Brockbank instituted a series of interesting investigations as to the solvent power of drugs upon gall-stones outside of the body, although he recognizes the fact that the conditions under these circumstances are quite different from those which exist during an attack. As a result of these studies he finds that none of the inorganic drugs have any solvent power whatever upon gall-stones, although by freeing the portal circulation and keeping the alimentary canal clear of fæces he believes that they are powerful adjuvants to treatment. He finds, on the other hand, that gall-stones placed in olive oil undergo comparatively rapid solution, so that nearly seventy per cent. of their weight is lost in the course of ten days. Still more powerful for the solution and breaking up of the stones did he find the animal soap of the British Pharmacopœia, which caused a very much more rapid solution of these bodies.

He is, therefore, inclined to believe that the olive-oil treatment of gall-stones is based on the most rational principles; but it is not to be forgotten that under natural circumstances the stone is very largely protected from the action of the oil, and that when olive oil has seemed to give relief it has fortunately acted more promptly than the time required in his experiments. Brockbank is inclined to explain this by supposing that olive oil acts as an efficient antispasmodic as well as lubricant and solvent, and that the relaxation of the spasm of the gall-ducts and of the muscular fibres in the wall of the intestine, combined with partial solution or softening of the surface of the stone, explains how olive oil, when given in full dose during

an attack of colic, frequently gives relief. He believes that in those cases where the oil cannot be taken by the mouth, it may be given with advantage by the rectum, although he confesses that it is difficult to understand how this action can do great good, except, perhaps, by soothing any intestinal irritation. So far as the treatment of the patient is concerned between the attacks, Brockbank believes that the ingestion of four to eight ounces of olive oil per day will act as the best prophylactic, but appreciates at the same time that few patients would be willing to submit to this treatment without strong opposition. Such patients he believes should receive daily rectal injections of the oil, and if this after a short time becomes so disagreeable that the patient rebels, he thinks that a favorable influence can be exercised by ordering a diet containing large quantities of fat. It would also appear from his experiments that oleic acid is a valuable drug for internal administration under these circumstances. He is unable to discover that turpentine, ether, or chloroform have any direct effect upon the stone, and believes that any advantages obtained by their use are due to the antispasmodic influence. In those cases where a cholecystotomy has been performed and in which a calculus cannot be felt, yet in which the physician is positive a calculus exists, Brockbank suggests the daily injection into the gall-bladder of olive oil or of one-half-per-cent. solution of watery solution of animal soap of the British Pharmacopœia. This treatment he believes can do no harm, and may be advantageously substituted by a similar injection of oleic acid. On the other hand, chloroform, turpentine, and ether, if so used, might produce a dangerous amount of irritation.

From a comparatively limited experience, we are inclined to endorse everything which Brockbank has advised in connection with his useful clinical and experimental research, particularly in regard to the employment of phosphate of sodium as a prophylactic, given in the dose of from 2 to 4 drachms, or more, in hot water every morning before breakfast. We have certainly seen this treatment result in the passage of large amounts of what might be called hepatic gravel, and in the great amelioration of the attacks both in severity and frequency. Perhaps, by the frequent dislodging of small stones before they are large enough to obstruct the duct, prophylaxis may be accomplished.

Another remedy which, in the hands of some practitioners, has given good results, it is claimed, is the succinate of sodium, 5 to 20 grains three times a day. So far as we know, its employment is purely empirical, and there are no scientific studies which would indicate that it has any particular value.

To those who are interested in this subject, Dr. Brockbank's paper will prove of great value. We hope that he will continue his studies, and that others may be stimulated to similar research, in order that more light may be thrown upon this manifestation of perverted hepatic functional activity.

THE ABORTIVE TREATMENT OF GONORRHŒA.

THE abortive treatment of gonorrhœa—that is, the application of remedies which so modify the disease that it runs its course in a few days or, at most, two or three weeks, in place of the six to ten weeks usually required for cure—is, in one form or another, almost as old as the disease. Until discovery of a specific germ, and hence power to distinguish in the earliest stages gonorrhœal urethritis from simple inflammatory attacks due to mechanical or chemical irritation, or to micro-organisms other than the gonococcus, there was no good reason for believing that treatment was ever successful in aborting gonorrhœa. It reasonably could be claimed that all cases which were cured were not specific in character, and hence would have recovered without treatment in a few days.

Since the general recognition of the gonococcus as the causative agent in gonorrhœa it is easy to determine whether or not abortion of the disease is ever possible, for this micro-organism is readily stained, is easily recognized by even an indifferent microscopist, and on careful search can be found even in the earliest discharge. Though it has been proved that there is a pseudo-gonococcus present in the normal urethra which can be distinguished from the gonococcus only by culture, this is so rare that its presence need not be considered, and we can safely assume that when a urethral discharge contains gonococci, the disease is certainly gonorrhœa; that if it is a first attack, and is not treated, running will become profuse, will continue for six to ten weeks, and will be accompanied by ardor urinæ, chordee, and possibly symptoms of acute posterior urethritis. If, under any treatment, attacks of urethral inflammation, the discharge of which shows the presence of gonococci, are cured in three days to fourteen or twenty-one weeks, it is safe to assume that treatment is responsible for this cure and that the disease has been aborted or

materially shortened. As the case stands to-day, then, all that is needed to prove that gonorrhœa can be aborted is a record of cases contributed by a conscientious observer, in which, before treatment was begun, gonococci were discovered in the discharge.

Diday records many successful attempts at abortive treatment, but unfortunately omitted to prove by the presence of the gonococci the specific nature of the urethritis. The absence of microscopical examination discredits his results from a scientific stand-point, since he applied his treatment particularly to those cases in which the early symptoms suggested rather simple irritation than gonococci infection. Diday held that an abortive injection must be practised as early as possible, and that the favorable time is when the slight secretion is scarcely colored and more mucous than purulent, and when the lips of the meatus are not swollen. His abortive injection is a five-percent. solution of nitrate of silver, only the fossa navicularis being subject to treatment, the finger pressing the urethra so firmly one and a half inches back that none of the fluid can pass behind this point. This lotion is injected under pressure, so that all the folds and follicles of the navicular fossa are distended.

Though Diday's results can be questioned because of the lack of examination, others have followed his methods and have obtained satisfactory results. Thus, Edward Martin reports the Diday abortive treatment in eight cases. In seven of these gonococci were found. In six of the cases the patients were well in the first ten days, and there was no recurrence of discharge. This percentage of success is probably considerably higher than that obtained by others, since there have been few reports favoring Diday's method, though undoubtedly it has been tried by many.

A reason for failure of this method in a large proportion of cases is given by Janet, who holds that not only do the gonococci quickly penetrate to the subepithelial tissues, but that they rapidly spread along the urethra, so that by the fourth day of the attack this entire channel is often infected, the inflammation involving the posterior as well as the anterior urethra. Hence any treatment limited to the first one or two inches of the urethra will, in the large number of cases, prove fruitless.

The method of attempting abortion by frequent injections of weak antiseptic lotions, such as nitrate of silver, corrosive mercuric chloride, or mercuric salicylate, has also given many satisfactory results, since thus the superficial microbes are destroyed and the whole mucous membrane is washed out. This is the method which Janet strongly favors, though he abandoned it for one which he describes at length, and one which, if his statistics are correctly reported, is destined to radically change the treatment of gonorrhœa.

This consists in injections of permanganate of potassium. Janet reports, of twenty-one cases in his first series of attempts at aborting gonorrhœa, thirteen were successful and eight failed; the failures he attributes to imperfect technique. The second series of fifteen cases resulted in thirteen successes. In eleven of these the cures were very rapid.

His method is as follows: In the first place, careful search must be made for the gonococcus; next it must be determined whether the inflammation is anterior, total, or extra-urethral. The diagnosis of anterior and posterior infection is made by means of the urine passed in two portions. If the second portion is perfectly clear after the patient has remained for a long time without urinating, it is quite certain that the posterior urethra is not involved. When the second portion contains pus, diagnosis of posterior urethritis is assured. During the whole treatment the second portion of water should be examined, since, even though on first examination the posterior urethra is free, it may subsequently become infected. Extraurethral crypts, in which the gonococci may be numerous, are always seen in cases of hypospadia, and are frequent in those who have an apparently normal meatus. They are readily found on separating the lips of the meatus, and are placed at the upper commissure. These extraurethral foci of infection should be carefully disinfected during the entire course of treatment, either by thoroughly washing or by more radical surgical treatment. Preputial folds should be washed out after each treatment and as often as possible between treatments. Vegetations should receive surgical attention before beginning treatment. Crypts of the meatus are washed by means of a fine canula, if they are wide and shallow; if they are narrow and deep, they should be opened, so that they communicate freely with the meatus. Abscesses, if present, should be opened and disinfected.

As to the condition of the urethra which allows of abortive treatment, the quantity of the discharge has little reference to this. The only condition which should prevent an attempt is in the case of hyperacute inflammation, great swelling of the urethra and meatus, painful erections during the night, and violent ardor urinæ, since under these circumstances

the treatment is painful, penetration of the lotion difficult, and hemorrhages are free. When applied to cases which have already reached this acute stage, the treatment cannot be called abortive.

A rubber siphon about three yards in length is attached to the reservoir. To the extremity of this tube is fixed a blunt conical glass nozzle, of such shape that the urethral orifice is entirely closed when the nozzle is applied. A hard rubber stop-cock is employed. The stop-cock, nozzle, and lower extremity of the tube are kept soaking in antiseptic solution. When the anterior urethra is to be irrigated, the reservoir should be elevated about one and a half feet; when the entire urethra is to be washed out, the elevation should be from three to five feet. The rapidity of flow is regulated by digital pressure exerted upon the soft rubber tube. Where the patient is extremely sensitive, or the resistance of the compressor urethræ muscle is unusually obstinate, cocaine may be used. This drug is introduced by means of a small syringe holding three drachms, the patient being directed to make an effort as though he were about to urinate as the injection is forced in. This allows it to penetrate into the posterior urethra and to anæsthetize this portion of the tube. The solution is held in the urethra for a few minutes; provided it is not of greater strength than one-fourth of one per cent., there is no danger from toxic effects. Permanganate solution should be warm, and the irrigation should be made immediately after urination. The patient having micturated, the glans and prepuce and crypts and follicles in the anterior urethra are thoroughly washed by means of a stream flowing through the glass nozzle. Finally, this nozzle is held firmly in the meatus and the bladder is filled. This backward flow into the bladder is encouraged by directing the patient to make efforts at urination. As soon as he feels an urgent desire to accomplish this act, the nozzle is withdrawn and he is encouraged to do so. If necessary, the bladder is again filled. The patient is then directed to change his linen, to wash his prepuce and glans with a solution of permanganate (1 to 2000) at least once between the irrigations, after micturition, and sometimes it is well to pack the meatus with absorbent cotton.

As to the strength of solution, it is almost impossible to determine what will be appropriate for any individual case. This must depend upon the intensity of the reaction. The more marked the inflammatory symptoms the feebler should be the dose, and *vice versa*. The indications as to inflammatory reaction are found in the appearance of the meatus, in the amount of discharge, and in the pain connected with urination. When the inflammatory symptoms are pronounced, 1 to 4000 is the proper strength with which to begin; if the symptoms are of moderate severity, 1 to 2000; if inflammation is practically wanting, 1 to 1000.

It should be borne in mind that with the same dose quite different effects can be produced, depending upon the manner in which the solution is applied. Irrigation with a weak solution, conducted slowly, the bladder being filled several times, produces the same effect as a strong solution irrigated rapidly, only a small quantity of liquid being employed, and, *per contra*, an irrigation of 1 to 2000 made with a pint, and filling the bladder but once, has no more marked effect than a full dosage of solution 1 to 4000. As to the repetition of the irrigation, this varies according to the intensity of the gonorrhœa. The more acute the latter the more frequent should be the irrigation. In subacute and chronic cases, once in twenty-four hours is sufficient. In acute cases, once every twelve hours, continued for two or three days; then once every eighteen hours until about the sixth day; then about once in twenty-four hours is sufficient. When two irrigations are made the same day, the second should always be with a weak solution.

Janet gives two tables of treatment: one for the abortive treatment of anterior urethritis, in which he begins with a strength of 1 to 4000, and on the eighth day finishes with a strength of 1 to 500; the second, in which he begins with the same strength; on the fifth day uses 1 to 1000 to the anterior urethra, 1 to 2000 to the posterior; on the eighth day uses 1 to 500 to the anterior, 1 to 1000 to the posterior. He holds that 1 to 1000 is as strong a solution as should ever be used to the posterior urethra, since 1 to 500 employed here will produce painful tenesmus. In the first few hours following irrigation there is a whitish secretion, followed by clear serum, sometimes slightly blood-stained; then absence of secretion; finally, reappearance of purulent discharge, together with the gonococci. The return of purulent secretion is an indication that the effect of the irrigation has passed off; hence these washings should succeed each other so rapidly that this recurrent purulent discharge should be entirely prevented,—that is, the second irrigation should be given during the dry period occasioned by the first irrigation.

As to the question of predicting a cure, this is difficult. Usually ten or eleven washings will be sufficient to bring about abortion. At

this time there is no discharge and few or no shreds. Sometimes there is a little mucous discharge, especially if a strong solution has been employed. In this case irrigations are stopped, the patient is advised to continue hygienic directions, and is told to report immediately on the first sign of white discharge. In the absence of this he appears eight days after the last irrigation.

If recurrence takes place, the discharge usually appears the second or fifth day after the last washing. Janet states that this happened in three out of fifteen cases; the first time because a focus of infection near the frænum was neglected, the last two times because a posterior urethritis was not suspected and received no treatment.

In case of recurrence the irrigations are again administered; sometimes two or three are sufficient; sometimes it is necessary to give the complete series. When the patients are cured, eight days after irrigation there will be found a non-inflammatory meatus, entire absence of discharge, and absence of shreds in the urine. For the next two months such a patient is peculiarly susceptible to renewed infection.

When, in spite of this treatment, there is slight mucous discharge, Janet advises irrigation of the anterior urethra with nitrate of silver (1 to 2000). The details of fifteen cases are given,—nine cases of anterior urethritis, six of total urethritis. The discharge when first observed varied in age from a few hours to five days. Two complete failures marked this series,—one because of the acute inflammation already developed when the patient came under observation and because of a diverticulum at the meatus, which was not divided; the other because of soft chancres which prevented thorough disinfection of the prepuce. There were three partial successes—that is, cure in thirteen, twenty-five, and thirty-eight days respectively—and ten complete successes.

Janet holds that permanganate has a peculiar action on the urethra. It occasions a slight œdema of the urethra; while this lasts not a single microbe can be found in the secretion. The success of the permanganate treatment seems to show that the microbes are so influenced by the alteration of their culture ground, dependent upon the œdema, that they cease to grow; hence if this condition of the urethra is sufficiently maintained, the complete destruction of the microbes is sure. It therefore follows that for successful treatment it is necessary to continuously keep the mucous membrane in a certain condition of reaction. Carried too far, the growth of the microbe is encouraged; not carried far enough, inhibition ceases. This special reaction is fugacious in proportion to the acuteness of the gonorrhœa; hence the necessity for frequent repetitions of the injections. The special skill in treating this disease depends upon recognizing the required condition of reaction, and in so tempering the strength and the frequency of treatment that this condition is maintained for several days.

The advantages of this abortive treatment are well summarized by Janet. In case the anterior urethra alone is affected absolutely, no pain is excited; often when the entire urethra is washed, the pain is slight and fugacious. No injurious reaction is exhibited on the part of the urethral mucous membrane, as shown by the almost complete absence of epithelial exfoliation. Discharge almost entirely ceases from the first treatment, and in eighty per cent. of cases the treatment will be successful. The objection to the treatment is that it is troublesome for both the patient and the physician.

HEMORRHAGIC GLAUCOMA AND ITS TREATMENT.

EXTRAVASATIONS of blood into the retina, often indicative of arterio-sclerosis in general, or, in particular, of a more definite disease,—viz., malaria, gout, rheumatism, chronic heart lesions, Bright's disease, diabetes, syphilis, and affections of the liver- and blood-manufacturing glands,—are signs calling for critical scrutiny of the functions of the entire organism. In a certain number of these cases the hemorrhages are not only the indices of serious constitutional disturbances, but are also the precursors of sudden rise of tension, or a type of glaucoma, that, so far as vision is concerned, presents a singularly gloomy outlook. In fact, among the various diseases of the eye, during the course of which there may be the development of secondary glaucoma, none is fraught with graver prognostic apprehension than retinal hemorrhages. Hence an analysis of the opinions and experiences of the best-informed surgeons, as well as added personal experience, is of the utmost importance.

This, fortunately, has recently been accomplished by Bourgon, in France (*Annales d' Oculistique*, March, 1893), and Risley, in this country (*Ophthalmic Record*, December, 1893), and it is to the paper of the latter surgeon we direct attention as an excellent review, written in a judicial spirit, of the measures suited to the management of this serious ocular disease. Al-

though never a frequent disease, occurring once in about seven thousand cases, according to Bourgon, and four times among twenty thousand cases seen by Risley, its unfavorable prognosis, not only, as Wadsworth puts it, "as to sight, which is practically gone before the glaucoma appears, but as to the existence of the organ," renders welcome all fresh information on this topic.

Following Bourgon, Risley divides the disease into the hemorrhagic period and the period of confirmed glaucoma. During the first period the evident indication is to ascertain, if possible, the cause of the retinal extravasations and to treat the existing diathesis, whatever that may be, particular attention being paid to the two most probable factors determining the hemorrhages,—viz., changes in the composition of the blood and tissues of the blood-vessel walls and disturbances of the circulation. For this purpose we naturally turn to iodide and bromide of potassium, iron, bichloride of mercury, arsenic, quinine, ergot, cardiac sedatives, salines, and various mineral waters, according to the indications. Having some direct influence upon choroidal congestion, ergot and bromide of sodium should receive special mention. The diet is of much importance, and a regimen suited to a uric-acid diathesis, or positive gouty dyscrasia, will, in most instances, be advisable. Absolute rest for mind, eyes, and body is of paramount importance, and the use of tinted protective glasses is evidently indicated. Depletion from the temple by leeching is a valuable adjunct, and of marked service, or certainly a safe practice, is the twice-daily instillation of a solution of the sulphate of eserine ($\frac{1}{2}\frac{1}{4}$ grain to 1 fluidounce), to which a few grains of boric acid and one grain of cocaine may be added. Such careful and systematic medication may be the means of preventing rise of tension, and is, perhaps, one of the reasons why the complication is fortunately of comparatively rare occurrence.

If, however, in spite of treatment, or without it, glaucoma supervenes, and of an inflammatory type, the question of operative interference is difficult to decide, from the well-known fact that measures—*e.g.*, iridectomy—usually productive of relief in primary glaucoma, in this disease only too often precipitate blindness by encouraging fresh hemorrhagic extravasations. Bourgon details the results of iridectomy in twenty-four cases, as sixteen failures and eleven enucleations, and in a circular letter addressed by Risley to a number of American ophthalmic surgeons, the opinions were in practical unanimity as to the inadvisability of iridectomy. Posterior sclerotomy, on the whole, offers a more favorable outlook, although, as Hotz remarks, usually "no kind of operation will save the eye," and the relief of tension and pain following sclerotomy in most instances is transitory.

Risley's conclusions, after a thorough study of the whole subject, in so far as the management of the period of confirmed glaucoma is concerned, are found in the following quotation: Strong solutions of eserine, frequently repeated, local bleeding, and *hot* applications to the eyeball give partial but only transient relief. Full doses of hydrate of chloral, having the power to reduce tension, according to Stilling (an observation confirmed by the writer), should be exhibited. Pain and increased tension continuing, paracentesis corneæ may be tried as a temporary measure; and, finally, as a more radical means, sclerotomy or paracentesis of the vitreous chamber. If by the latter operations the tension is relieved and deepening of the anterior chamber is secured, a free anterior sclerotomy, or, if the iris is moderately healthy, a broad iridectomy, may be tried.

It will thus be seen that Risley, while leaning towards sclerotomy, is unwilling, in selected instances, entirely to abandon the use of iridectomy. He bases this opinion upon the reports of several cases in which iridectomy gave relief from pain and tension, saving the eyeball, although sight was lost. Necessarily, no surgeon would operate on a case of this character without carefully explaining the exact chances and obtaining consent, in case of failure to secure relief, to perform enucleation or one of its substitutes.

PEROXIDE OF HYDROGEN IN MEMBRANOUS THROAT-AFFECTIONS.

IN the *American Journal of the Medical Sciences* for November, 1893, Dr. Williams, of Boston, contributes a paper upon "The Differential Diagnosis and Treatment of Membranous Affections of the Throat." Under the head of "Treatment" he says, "Chlorate of potassium does not seem to be of service, and in excessive doses may do serious harm. Nitrate of silver does not penetrate deeply enough. Chromic acid is too active. Iodine and bromine are too irritating." The digestives have not succeeded in his hands in removing the membrane. Tincture of the chloride of iron is a useful, but by no means a specific remedy. It does more good when taken internally, probably, than

when locally applied. He finds that corrosive sublimate has an antiseptic rather than germicidal influence in this disease. Thus, while a solution of 1 to 10,000 may stop the spread of the membrane, it does not kill the bacilli. He finds that a solution of peroxide of hydrogen of between twelve and twenty-five volumes killed the bacilli in ten seconds, provided that the reaction was slightly acid; but it required a fifty-volume neutral solution of hydrogen peroxide to do the same work. He points out that the ordinary hydrogen peroxide as found on the market possesses a strength of seven to ten volumes; that some are neutral and others acid. The fact that acid solutions have been found more valuable than neutral ones is interesting, as it has generally been considered that those preparations of hydrogen peroxide possessing distinct acid properties were not therapeutically useful. As a result of his clinical and experimental work, Dr. Williams believes that the solutions of twenty-five to fifty volumes are of value not only through their germicidal influence, but also through their power of breaking up the membrane already formed. The drawbacks to the use of strong solutions of hydrogen peroxide consist in the fact that when acid they cause pain, which, however, lasts but a short time. Strong acidity is not needed. Half per cent. to one per cent. is sufficient. The other disadvantage is that these strong solutions have heretofore not been readily procured and they do not bear transportation well. Dr. Williams states that they can be had, however, by evaporating a ten-volume solution in an open dish over a water-bath until it is sufficiently concentrated. He also reminds us that it is a powerful bleaching agent, and of all substances with which it comes in contact. In many cases it is necessary to make the application every four hours during the night and more frequently during the daytime. The solutions are best applied by means of a swab, fine syringe, or, better still, a spray.

Reports on Therapeutic Progress.

TREATMENT OF RENAL INSUFFICIENCY.

This important subject is discussed in the *New York Medical Journal* by ROCHESTER.

The conclusions to be drawn from the cases he has seen as regards treatment are:

1. We should not try to stimulate into activity an organ that is inflamed or degenerated, by the use of drugs that excite functional activity of such organ. In the case of the kidney, we should rarely, if ever, have recourse to stimulating diuretics, or to diuretics which, like digitalis, act by increasing the arterial pressure, until we have relieved the venous congestion by diaphoresis or catharsis, or both.

2. Attention to diet is of the utmost importance in these cases.

3. In order that the materials to be excreted by the kidney may come to that organ in the most unirritating form, the metabolic process should be carried to completion; this is to be accomplished by regular systematic exercise, which is to be obtained by massage when active exercise is not advisable, by inhalations of pure oxygen gas when it is evident that sufficient oxygen is not obtained from the air, and by the dilatation of the katabolic materials by drinking large amounts of distilled water, or one of the mildly alkaline waters, such as Bethesda, Poland, or Buffalo lithia water.

4. The anæmia that accompanies these cases should be met by the use of oxygen and iron.

5. As the symptoms indicative of this condition are the result of toxæmia which depends upon the non-elimination from the body of certain katabolic materials that should normally be carried off through the kidneys, and as these organs are in such condition that they cannot do their work, all other avenues of elimination should be opened up for the escape of these poisons. This is to be brought about by exciting the activity of the skin by means of hot-air or steam baths, accompanied and followed by vigorous massage, keeping the bowels open by means of salines and by washing away the contents of the colon, thus keeping the mucous membrane in a proper condition for excretion, with copious enemata of slightly alkaline water, occasionally followed by a high enema of 500 or 600 cubic centimetres of pure olive oil, as suggested by Fleiner.—*Berliner Klin. Wochenschrift*, 1893, Nos. 3 and 4.

OBESITY TREATED BY AN EXCLUSIVELY NITROGENOUS DIET AND COPIOUS LIBATIONS OF WARM WATER.

SAVILL gives an account of his treatment of cases of obesity in the *Lancet*.

A man, aged sixty-eight, was admitted to the Paddington Infirmary on September 21, 1891, on account of ulcer in the leg. He was about five feet ten inches in height and weighed twenty stone four and a half pounds. His girth was so great that it was necessary to get a special suit of clothes made for him, and he was quite unable to walk, chiefly by reason of his

bulk, but partly also because of stiffness of the hip-joint due to morbus coxæ senilis. There were also a suspicion of chronic Bright's disease and a history of gout.

He had formerly (from August, 1890, to February, 1891) been under the writer's treatment, on the same plan as the one about to be described, for obesity and ulcer of the leg. While in the infirmary on that occasion his ulcer had healed and his weight had been reduced from twenty-one stone to seventeen and a half stone; but a month or two after leaving his leg again became ulcerated and his bulk again began gradually to increase.

Stoutness had run in his father's family and his father had been as corpulent as himself, but his mother and her people were all small. As for the patient, he had lived an abstemious life, though he had been in the habit of drinking one or two pints of beer a day with his meals, and had worked hard as an engine-fitter all his life. He had been stout as a child, but at the age of twenty-one he weighed only twelve stone, and, though always rather bulky, had but recently been unable to work on account of his size.

He was at once put upon a diet consisting of one pound of cooked fish and one pound of cooked lean meat daily, with a pint of warm water sipped at intervals, as warm as he could comfortably drink it, every two hours. The fish and the meat were distributed into various meals, according to the taste of the patient, but no bread and vegetables, milk, or any other article were allowed. He was an intelligent man, and entered heartily into his treatment,—a most important factor in success. He managed to drink about five or six pints of warm water in the day. His weight began at once to fall steadily. Thus, on September 21 it was twenty stone four and a half pounds; on October 2, nineteen stone eight pounds; on November 18, eighteen stone four pounds; and on December 4, seventeen stone eight and a half pounds. About Christmas time his dietary was a little relaxed, and he immediately went up seven pounds, but by January 15 he was reduced again to seventeen stone one pound.

After about four months' treatment, in January, 1892, he began to rebel a little, and the diet was modified by the addition of two small slices of bread and butter with breakfast and tea, and the addition of milk and sugar to his tea in the morning and evening. Nevertheless, the weight still continued to diminish (February 7, sixteen stone seven pounds). On February 7 he returned to ordinary meat diet, such as the other patients had, with the omission of potatoes. At first the weight went up a few pounds (sixteen stone ten and a half pounds), but then the downward course was resumed, and on March 21, 1892, he weighed sixteen stone six and a half pounds. He then left the infirmary to return to work, having lost nearly four stone in six months, during four months of which he was on a strictly nitrogenous diet, and for one and a half months of which he was on ordinary diet, without potatoes.

His ulcer was healed within a month of his admission, and he began to get up and about, taking as much exercise as the ward space allowed; and, although he took no medicine excepting an occasional aperient, the pain and stiffness of the hip-joint soon disappeared. He passed large quantities of urine of low specific gravity, which very frequently contained crystals of uric acid. Dr. Haig's valuable observations on the urine are appended. Once only it contained a trace of albumin (November 6, 1891). Subsequent observations show that, though he takes ordinary diet, avoiding beer, he keeps at about sixteen and a half stone and in good health. He continues to take draughts of warm water when circumstances allow.

The rationale of this treatment is apparently that the patient supplies the necessary hydrocarbons and carbohydrates, which are absent from the diet, from his own economy; in other words, he lives on his own fat. Dr. Lloyd suggested this treatment to the author. It is something like that adopted by Marienbad. It was certainly very successful in this case, for the man was not only thinner, but was in much better health in every way and able to resume work. The permanence of the improvement after resuming ordinary diet is a fact worthy of special attention.

It is useless to attempt the regimen without the hearty co-operation of the patient. In another case, weighing seventeen and a half stone, in the same ward as this patient, the same treatment failed because he would not carry out the dietary. The copious libations of warm water are probably of great importance, and the patient probably retains his decrease in weight owing to this avoidance of beer and the taking of warm water.

Dr. Haig says he hoped to discover why obese patients, when put on an exclusively animal diet, rarely suffer from attacks of gout, though in ordinary dietetics any excess in meat food has such a powerful influence in producing this disease.

The following are some of the results ob-

tained from an examination of the urine of the twenty-four hours ending 8 A.M. on December 21, 1891, when the patient was on the special diet and had been on it for three months. That of twelve hours of the day was dark amber and measured forty-four ounces; that of the night was pale amber and measured seventy-four ounces; the mixture—one hundred and eighteen ounces—was pale amber, free from deposit, of specific gravity 1012, and containing no albumin. This yielded 1.5 per cent. of urea (equal to 817 grains) and .04704 per cent. of uric acid (equal to 25.5 grains), giving a relation of uric acid to urea of 1 to 32. On examination on other occasions, between 800 and 900 grains of urea and about the same proportion to it of uric acid as that above given was found, and there was no evidence that he was retaining any large quantity of uric acid. His weight at that time was about seventeen stone twelve and a half pounds, so that his excretion of urea was about 3.4 grains per pound. An examination of the urine of the twenty-four hours ending February 10, 1892 (being the urine of the second day on ordinary diet), gave the following results: Day urine, thirty-four ounces; night urine, seventy-two ounces; together, one hundred and six ounces; pale amber in color; specific gravity 1010, and containing a trace of albumin; urea, .95 per cent. (equal to 465 grains); uric acid, .03696 per cent. (equal to 18 grains); relation of uric acid to urea, 1 to 26 (nearly). His weight is now sixteen stone seven pounds, and the urea is, therefore, equal to two grains per pound, and the excretion of uric acid has decidedly increased. The specific gravity of the urine was always low, and it was scanty by day and profuse at night. His pulse, whenever examined, was below 70 in rate and of distinctly high tension. It will be noted that 3.4 grains of urea per pound is just below the normal physiological quantity, and though, no doubt, something must be allowed for his adipose tissue, Haig has under his care a man of less than half his weight who is on a highly nitrogenous diet for diabetes, but who still probably takes less than hundred grains of urea, or about seven grains this man, yet he often passes upward of eight per pound; so that, even if it is admitted that the large quantity of fluid taken did to some extent interfere with digestion, and a further large allowance is made for adipose tissue, the urea was still very low, considering the diet. Even on the purely animal diet the acidity of the urine was low and he retained but very little uric acid; but had this same diet been given to a younger man without Bright's disease, and with more active metabolism, the urea would have been more like eight to ten grains per pound, the acidity would have been higher and the uric-acid excretion much less (in relation, say, of 1 to 40 or 1 to 50). He would have retained and accumulated much more uric acid, and, as a result of this, would soon have suffered from gout. So far, then, as one can judge from the results in a single case, it is the extremely low metabolic activity in such patients that prevents their accumulating uric acid and suffering from gout. The patient under notice, if the history may be trusted, suffered pretty severely from gout in the feet in previous years, but when he became obese and unwieldy, and consequently unable to work, his metabolism, urea, and acidity rapidly fell, and he continually excreted an excess of uric acid from his joints in place of storing it in them; hence he lost his gout, but acquired uric acidæmia in its place, and this still further hampered metabolism and produced Bright's disease. So, when he came under observation, he was constantly excreting excess of urate and had no gout, and even the stimulus of the animal diet was insufficient to reverse the process or to cause a storage of urate and a relapse of his gout.

A CASE OF POISONING FROM AN OVERDOSE OF CODEINE.

In the *New York Medical Record*, SPRATLING details a case of codeine-poisoning.

Shortly after ten o'clock on the evening of June 8 the author was requested to see a young married woman who had taken an overdose of codeine. Immediately after dinner, about seven o'clock in the evening, she had taken sixteen ½-grain pills, making eight grains altogether. She had suffered for some months from a painful disease, and had been ordered by her physician to take codeine in ¼-grain doses for the relief of pain and to overcome a persistent insomnia. Not deeming the ¼-grain pills of sufficient strength, the patient then procured from the druggist a vial labelled as containing one hundred ½-grain codeine pills. Three hours before the author's visit she had swallowed sixteen of these, as she avowed, for the purpose of securing a good night's sleep. An hour later she experienced considerable nausea, and vomited a small quantity of semi-liquid matter. He found her awake, able to converse well, but extremely restless and irritable. She could not lie in one position, but constantly changed it by tossing, almost violently, from side to side of the bed. At frequent intervals she would manifest convulsive movements, involving the

entire voluntary muscular system. These movements were most marked in the upper extremities and the head. She suffered greatly from intense irritation of the skin over the entire body. This irritation was most annoying along the flexor surfaces of the forearms and on the back. She had an attendant rub her back so vigorously with a coarse towel that the skin in many places was broken. The surface of the body was warm and dry. The pupils were fixed in pin-point contraction. Respirations were 12 per minute. She complained of great thirst and an uncomfortable feeling of fulness in the head. She did not experience the pleasant effects following the exhibition of morphine. She frequently remarked that her "thoughts were going round and round." After the painful irritation of the skin had been relieved by sponging the body with solution of bicarbonate of sodium, she sank into a light doze, from which she would awake in a few minutes with a start. The skin was hyperæsthetic to a marked degree. She was subjected to the usual treatment for opium-poisoning, and in a few hours was much improved.

By noon on the following day she had entirely recovered from the effects of the drug in every way, save that considerable muscular weakness remained. We apparently have no fairly accurate knowledge as to what amount of this drug may be regarded as a fatal dose. In the latest edition of Wood's "Therapeutics" it is stated that "Robiquet, in a series of experiments, found that doses of .01 to .03 gramme (.15 to .46 grain) produced a feeling of contentment, calmed nervousness, and induced refreshing sleep, while .1 to .2 gramme (1.53 to 3.07 grains) caused deep sleep, followed by nausea and vomiting." Quoting further from the same author, he adds, "Dr. A. S. Myrtle records a case of severe poisoning by 4 grains of codeine. And Dr. D. Walsh reports serious poisoning by 8 grains of codeine."

CLINICAL REMARKS ON CERTAIN CHANGES OBSERVED IN THE URINE IN MYXŒDEMA AFTER THE ADMINISTRATION OF GLYCERIN EXTRACT OF THYROID GLAND.

Dr. Ord and Mr. White publish in the *British Medical Journal* a careful clinical observation on the effect of thyroid extract upon the urinary secretion in myxœdema.

A patient suffering from myxœdema was admitted to St. Thomas's Hospital on April 19, 1893. After careful daily examination of the food and the urine, she began, on May 1, to take 20 drops of a glycerin extract of the thyroid body of the sheep daily. The dose was equivalent to a sixth part of the whole thyroid body of the sheep.

For a week previous to May 1 the patient had been placed on a diet carefully ordered, so that its elements should be as much as possible the same day by day. The particulars of this diet and its equivalent in chemical examination will be published subsequently. The same diet was maintained after the administration of the thyroid extract during the whole period of the treatment of the patient in hospital.

After the administration of the thyroid extract a marked change was observed both in the volume of urine passed and in the quantity of nitrogen excreted. An increase in the volume of urine is the first point to be noted. As regards the excretion of nitrogen, the quantity up to the time of the administration of the thyroid extract corresponded fairly with the amount of nitrogen taken in the food, being, as one would expect, slightly less. Bearing in mind this fact, that before treatment the nitrogen excreted in the urine was slightly less than that taken in the food, it is of importance to note that three days after the first administration of the thyroid extract the excretion of nitrogen in the urine exceeded the amount introduced in the food, and that this proportion, very much marked in the earlier days of treatment, was practically maintained so long as the patient was under observation.

The total nitrogenous excretion was determined, as well as the excretion of urea, in order to ascertain whether the nitrogen might be excreted in any form other than urea. The records show that the relation of total nitrogen to nitrogen as urea remained about the same as in normal urine, thus indicating that the nitrogen was still excreted chiefly as urea. It was also seen that the difference between organic matter and urea remained about the same during the continuance of the experiment, thus showing that, in addition to water, the increased excretion was urea or other nitrogenous matter. At the same time it is important to notice that the patient lost weight rather rapidly in the first week of treatment,—namely, from eight stone four and a half pounds to seven stone thirteen pounds, with a further but more gradual loss of three pounds. The temperature of the body was raised; before treatment it had been subnormal, ranging from 96.6° to 98.6° F., ranging afterwards from 97.6° to 100° F., the maximum temperature being reached on the thir-

teenth day after treatment had begun. As regards the loss of weight, we have to take into account the fact that the patient, having previously a very dry skin, had free perspiration after the administration of the drug.

With regard to the excretion of inorganic matter, it had occurred to them that, with the increased excretion of urea and the associated rise of temperature, changes in the excretion of saline matters, such as occur in pyrexia, might be looked for. It appears, however, that in this case the excretion of the inorganic substances determined was very little affected by the thyroid treatment.

The acidity of the urine was observed to follow closely the variation in the quantity of phosphoric acid eliminated, thus being evidently due to acid sodium phosphate as in normal urine. It is to be regretted that the sulphates in the urine have not been determined, seeing that they might have shown whether the increased nitrogenous excretion might be referred to destruction of proteid substances or some other form of nitrogenous matter.

The writers present the following conclusions as the result of the treatment and observations in this case:

1. That the urine is increased in volume.

2. That the nitrogen excreted in the urine exceeds the total quantity of nitrogen in the food.

3. The phosphoric acid and chlorine elimination are practically unaffected.

4. That the increased nitrogenous excretion is chiefly in the form of urea.

5. That the body-weight is rapidly diminished.

6. That the temperature of the body is raised.

A chart is appended showing the changes in the weight of the body, the nitrogenous value of the food taken daily, and the excretion of nitrogen after treatment.

They propose, also, to publish later a full report of their observations, with the tables illustrating them.

THE THERAPEUTICS OF LUPUS VULGARIS.

HOFRATH D. VEIEL (*Berliner Klinische Wochenschrift*, No. 39) describes the manner in which he uses pyrogallol for the treatment of lupus vulgaris. The first treatment consists in the destruction of such lupoid tissue as is visible and can be felt. For this he chooses his method according to the locality and variety of the lupus, sometimes a mechanical treatment (scarification, scraping off), sometimes a chemical one (caustic potash, or nitrate-of-silver pencil, or pyrogallol vaseline, ten per cent.), sometimes a thermic treatment (thermo-cautery, galvano-cautery). When the pyrogallol cannot be used alone from the first, he uses a bandage of ten per cent. pyrogallol vaseline salve spread on lint. The first bandage is left for two days; from the third day on the same dressing is renewed once a day. In this manner he seeks fully to destroy any lupus particles which may have escaped the first treatment. This is quickly accomplished. It is advisable to protect the surrounding healthy skin by a plaster (for example, of zinc benzol salve on mull) from the action of the pyrogallol, which produces a very painful irritation.

On the fourth or fifth day the application of the strong pyrogallol is usually exceedingly painful, so that in many cases morphine injections become necessary. An addition of cocaine to the salve did not prevent the pain. The pain is most severe upon the entrance of air when the bandage is moved or opened. The change of bandage should be made as quickly as possible and very carefully applied. When this pain occurs it is time to leave off the strong salve and take another course. Formerly the healing was obtained under vaseline or iodoform, but Veiel now uses a weaker pyrogallol salve, which does destroy the lupoid tissue, but does not prevent the formation of healthy granulations. The two-per-cent. salve usually fulfils these conditions. If this is too strong, a one-per-cent. may be used, or even a .5- or .2-per-cent. may be used as soon as the granulated surface is formed.

The healing is usually very slow by this method, but the scars are smoother and prettier than by any other method of treatment. Therefore he uses the pyrogallol when the face or any part is affected, where a pretty scar is desirable. When this is no object, he uses transplantation after Thiersch's method as soon as the smooth granulated surface is formed.

The urine must be constantly watched during the treatment, and the use of pyrogallol at once stopped if albuminuria or hæmaturia occurs. Veiel has never in all the cases treated seen any permanent action upon the kidneys or general health, no doubt because the pyrogallol is used on comparatively small surfaces.

The good results in tuberculosis of the skin led him to try the pyrogallol also for that of the bones. In tuberculosis of the hollow bones it was without result, but cured four cases of caries of the tarsal bone. They were treated during two weeks with the ten-per-cent, and then until

cured with two-per-cent. salve. The cure took from eight to thirteen weeks.

He used a .5-per-cent. watery solution of pyrogallol for a girl who had lupus of the conjunctiva, dropping it in the eye daily. She has now been well for a year.

THE TREATMENT OF ACTINOMYCOSIS OF THE JAW.

A new case showing the efficiency of potassium iodide in the treatment of actinomycosis has been recorded quite recently by F. BUZZI and B. GALLI-VALERIO (*Nouveaux Remèdes; Journ. de Médecine de Paris*). The case occurred in a young man who contracted the disease while farming. The malady began by a localized pruritus on the external surface of the gums, invading afterwards especially the gum of the last right superior molar tooth. The patient sought to relieve the itching by scratching with a straw. The gum became tumefied, this tumefaction invading little by little the parotid and masseteric regions, all of the right cheek, the eyelids, the mastoid region, and the right half side of the neck just over the clavicle. The real nature of the disorder was not recognized at first. At the beginning the tumor was not painful and presented several fluctuating points. These purulent foci were opened; but, notwithstanding the cleansing of the walls of the abscesses and the irrigations of bichloride solutions, the tumor did not subside and the suppuration continued. Lancinating pains supervened over the neck and back of the head, and there was a slight feverish reaction. Examination of the pus afterwards showed the case to be one of actinomycosis. The patient was, therefore, put under iodide of potassium, in daily doses of 2 grammes. After a few days amelioration was noticeable. The fistulous openings began to close, tumefaction was diminished, and the pain disappeared. In three months more a complete cure was established.

A NEW TREATMENT FOR EPILEPSY.

It is believed that a prolonged treatment by opiates renders the organism extremely susceptible to the action of the bromides. This in mind, FLECHSIG, of Leipsic, has administered opium at the beginning of the treatment of epilepsy, in ascending quantities of from 15 centigrammes to 75 centigrammes, and even 1.05 grammes, in three doses, during six consecutive weeks. About this time he has stopped abruptly the administration of the drug, and prescribed then, during a period of about two months, bromide of potassium in doses of 7.50 grammes, gradually reducing the amount to 2 grammes per day. The convulsive seizures disappeared as if by magic on the suspension of the opium and the beginning of the ingestion of the bromide of potassium. This instantaneous effect was produced in two patients of the author, in whom all other medication employed for several years had utterly failed to do any good.—*Gaz. Méd. de Liège; Journ. de Méd. de Paris.*

CHLOROFORM NOT CONTRAINDICATED IN KIDNEY-DISEASE.

An interesting case of albuminuria is recorded by POITOU-DU-PLESSY (*Journ. de Médecine de Paris*), in which chloroform produced no evil effects. A woman in labor, and who had previously showed unmistakable evidence of albuminuria (from .40 to 1.30 grammes of albumin in the litre of urine), had to be anæsthetized in order to subdue the intense pains and the over-excited nervous system. A mixture of bromide of ethyl and chloroform was employed for the anæsthesia, the patient getting in all about twenty-five grammes of the ethyl bromide and eighty grammes of chloroform. The anæsthesia was complete, and the woman safely delivered of twins. The first analysis of the urine, soon after the confinement, showed that the albumin had almost entirely disappeared, only traces of it being detected. The author refers also to another case,—this one evidently of cystitis,—occurring in a man seventy-seven years of age, who was operated on for stone in the bladder, and in whom the chloroform anæsthesia lasted for fully one hundred and ten minutes. No untoward after-effects were observed. He believes, finally, that chloroform, judiciously and methodically administered, exercises no noxious influence on the kidneys, and that no fear should be entertained in regard to its employment in uræmic convulsions where we wish to combat the medullary excitability. Bromide of ethyl he likewise believes exercises a more pronounced action on the medulla and acts even more rapidly than chloroform; therefore, he considers advantageous the administration of a mixture of the two agents for anæsthetic purposes.

THE VALUE OF ALCOHOL IN PNEUMONIA.

In the *Boston Medical and Surgical Journal* an interesting account of a discussion on this topic is given.

At the Société de Thérapeutique, session of May 24, 1893, the subject of the therapeutic value of alcohol in pneumonia was again discussed. While the necessity of alcohol in the asthenic forms was admitted by all, the general sentiment of the authorities present was in favor of giving alcohol, as such, in its purity, sufficiently diluted. The old notion that old wines, whiskeys, etc., were to be preferred because of the "mellowing" properties conferred by age was condemned as a delusion. Such liquors were declared to be much more irritant to the stomach and less certain in their general supporting effects than pure ethyl alcohol, deprived of aroma.

One eminent speaker commended the alcohol of rice as being exceptionally free from fusel oil and other impurities.

We are told that the best French cognac is, "with few exceptions, nothing but the alcohol of beets, of poor molasses, changed and colored by the fabricator by the addition of infusion of tea and various essences which give it bouquet." Such brandies are almost sure to contain methyl alcohol in quantity certain, when freely administered, to do harm to the patient.

M. Huchard, who is an enthusiastic advocate of the employment of digitalis in the pneumonia of influenza, thinks alcohol the remedy *par excellence* of pneumonia by reason of its "dynamogenous action." There was much speculation as to how alcohol does good. M. Bovet declared somewhat vaguely that "by its dynamogenous action it supports the patient; by its reducing action it modifies the elements of the blood, which, rendered more fluid, undergoes an osmotic acceleration which expresses itself by the progressive decongestion of the pulmonary parenchyma." He also thought that "by its calorigenous reaction it develops a considerable number of calorics which cannot but have an influence on the evolution of the infectious elements, by this fact impeded in their toxic action and possibly destroyed. "What tends to prove this," he says, "is that, after the absorption of the alcohol, we find in the extractive matters of pneumonia patients an abnormal proportion of waste matters of the creatinic series, which are known to be endowed with a remarkable toxicity."

But, apart from such speculations, the best proof of the value of alcohol in pneumonia was affirmed to be clinical experience.

The combination of pure ethyl alcohol with digitalis constitutes, in the estimation of Huchard, the ideal treatment of pneumonia when any active treatment is needed. He gives the digitalis in the form of its active principle—the crystallized digitalin—in the daily dose of 1 milligramme by mouth.

It is a little singular that no allusion was made at this meeting to the therapeutic efficacy of strychnine in acute croupous pneumonia, a drug which is coming more and more into favor generally as a cardiac tonic in this disease.

RECTAL INJECTION OF SALINE SOLUTION IN A CASE OF SEVERE HEMORRHAGE DURING ABORTION.

In the *Lancet*, NICHOLSON details a case benefited by saline injections by the rectum after severe hemorrhage. He was called to see a woman, aged thirty, who had just aborted, the process being accompanied by very severe hemorrhage, which had nearly ceased on his arrival. The patient was the mother of three children born alive; all the labors had been accompanied by severe loss. So great had been the hemorrhage in her last confinement that her medical attendant had warned her against the risk of a further increase in her family. The patient was found in a deplorable condition from the acute anæmia. The pulse was 140 to 150, small, running, and occasionally irregular; the cardiac sounds were faint and the apex-beat imperceptible. She was extremely pallid and restless, and could not get enough air. She complained of nausea, with constant retching and vomiting of small quantities of mucus. Every few minutes she became thirsty and then faint, and was unconscious at times. Notwithstanding treatment by raising the foot of the bed, bandaging the legs, hypodermic injection of brandy, etc., the faintness, sickness, and feeble pulse continued, the patient becoming even more prostrate. After an hour the author determined to try the effect of a chloride of sodium enema, one drachm to the pint of water, at the temperature of 100° F. The patient having had severe diarrhœa, he was afraid the injection would not be retained, but this was successfully accomplished by holding a pad over the anus for a few minutes. The effect was extremely beneficial, for within twenty minutes the pulse fell to 120, the color improved, the sickness and faintness almost entirely disappeared, and she expressed herself as feeling much better and more comfortable. In half an hour she was able to take and keep down a small quantity of beef extract. Shortly after she had a little sleep. The patient made an excellent recovery and was able to be out about a month later. The saline enema in all probability saved the patient's life.

THE ETIOLOGY AND THERAPEUTICS OF ALCOHOLIC INEBRIETY.

MASON contributes to the August number of the *Brooklyn Medical Journal* an article upon this subject, and in regard to the therapeusis of these cases believes that much can be done. He points out that Luton, of Rheims, Belgium, was the first to use strychnine in alcoholism; then the Russians used it largely, and it was known as the "Russian treatment;" and, finally, the Americans adopted its use in such cases.

Strychnine has proved serviceable as both abortive and curative in acute alcoholic delirium, as well as useful in the more chronic forms of alcoholism. It seems to be tolerated in such cases. In cases of alcoholic poisoning under normal conditions we have no record of the value of strychnine as an antidote; interesting experiments might be made on the lower animals with the view of determining this point. Strychnine is an excellent cardiac tonic and one of the best respiratory stimulants, and might be used in general medicine in cases in which alcohol is oftentimes prescribed.

Oxide of zinc, during the past twenty years, has been used with advantage in cases of chronic alcoholic intoxication. This drug was largely brought to the notice of the profession by Dr. W. Marcet, of London, who had an extensive hospital and dispensary practice, especially in diseases of the nervous system; and as he found zinc of value in various chronic disorders of the nervous system, he used it also in cases of chronic alcoholism. His observations, published in a small work entitled "Chronic Alcoholic Intoxication," are an extremely valuable addition to the literature of alcoholism.

Quinine has been used more particularly in the later or convalescent period of the treatment of alcoholism.

The so-called "Red Cinchona Cure" for a time interested the public. Rational medicine does not recognize any special drug or specific remedy as a universal cure for inebriety, nor does clinical experience form any basis for such a claim. From the very nature of the case, such a remedy would be impossible. The etiology of inebriety is dependent on such a variety of causes, and its environments and complications are so numerous, that any one remedy could not fulfil all, or even meet the more important, of these conditions. However valuable drugs may be to meet certain indications in the various conditions incident to inebriety, we believe that, so far as the curative treatment of inebriety is concerned, drugs must assume a secondary place, valuable as they may be in their respective spheres.

In the treatment of the alcohol habit we place, first, restraint and seclusion in a special asylum for a definite period, and total abstinence during this period.

In a few words, concisely expressed, this statement includes the plan now adopted by the leading asylums of this country and of Europe for the recovery of the inebriate. It involves restraint (legal, if need be), seclusion, a special institution in which all the latest and best methods of dealing with the inebriate are procurable, a sufficient period in which to apply these measures, and, we need hardly add, a long period of total abstinence from all alcoholic liquors. Diet, rest, recreation, hygienic surroundings, and the exhibition of appropriate drugs are, of course, all included in the above plan.

The causes of degeneration having been removed and the factors of regeneration brought into action, new formation of nerve, muscle, and tissue must supplant degenerated tissue, if, haply, organic disease has not resulted in irreparable injury.

We have hinted at an hysterical element in the history of inebriety. The inebriate, whatever may be his condition, is largely influenced by his surroundings; hence, as almost in no other disease, must we recognize the value of psycho-therapeutic agencies, hitherto used by the charlatan, but recently recognized and practised by leading neurologists, as of value in their specialty.

In the light of such an historical element in the clinical history of inebriety, we can readily account for the apparent success of the so-called temperance movements that sweep over communities periodically and effect many apparent cures, or rather, in the language of the day, reformations. Such an element will also explain why, after such a tidal wave of excitement, relapses take place oftentimes in large numbers, and the period of excitement is followed by a period of reaction.

The occurrence of relapses is readily accounted for by the fact that the stimulus of the period of excitement buoys up the inebriate for the time being, during which strong mental emotion is a powerful factor. He is keyed up, as it were, for the time, and sustained by a moral stimulus. When this is withdrawn, reaction, followed by corresponding depression, sets in, and the old method of stimulation is again imperatively demanded and yielded to.

Why some inebriates go through such a period of excitement and do not relapse, and why others do, can be accounted for by the fact that the former are in a reasonable degree of physical health, and are not burdened, dragged down, and handicapped either by disease that is non-alcoholic or that is the result of alcoholic degeneration. The inebriates so affected are not influenced, or, if at all, only temporarily, by the so-called "temperance revivals" that appear and disappear with almost stated regularity in large and small communities, and we must add, do good, but only in the channel indicated.

It is by operating through this hysterical feature of inebriety that charlatanism may effect a temporary, possibly a permanent, success in a certain class of cases.

A physician observed to the writer that he had visited many asylums for the cure of the inebriate, and that when the medical superintendents were men of strong will power and personal magnetism, as he expressed it, more cures were effected than when the reverse was true. When the inebriety is due largely to neurasthenia, or in cases where the hysterical element largely preponderates, we believe psycho-therapeutic agencies, or even those that appeal to purely mental conditions, will be of service, but they will not cure a cirrhosed liver, lung, or kidney, or remove the physical causes upon which the inebriety may depend. In addition to those measures that appeal to the higher moral nature, there ought also to be combined such as meet certain intelligent wants. To this end all reasonable amusements, entertainments, and especially such occupations as will interest the person and keep him busy, should be encouraged, if not made compulsory.

Incidentally may be mentioned hypnotism as having been used especially by French physicians, with some benefit in cases of chronic alcoholism. The author has had no personal experience with it.

The therapeutics of inebriety is a new field as yet not fairly occupied, but we believe that the only true road to successful treatment will be along the lines we have indicated,—that is, a knowledge of the underlying causes and the use of such therapeutic agencies as will best remove these.

EPILEPSY CURED BY THE REMOVAL OF PERIPHERAL IRRITATION.

In the *Edinburgh Medical Journal* for July, 1893, MILLER records the case of a man, aged thirty-two, who was suffering from epileptic fits preceded by contraction of the flexor muscles of the right arm.

Patient said that five years ago he got a fright, having been arrested by the police in mistake for another person, and that he has been very nervous since then. Ten months ago patient had a quarrel with his parents, and left their house. He was in a state of excitement for some weeks after this, and worked very hard at his carpenter's bench to relieve his feelings. About a month after the quarrel he noticed a contraction in the palm of the right hand. About this time he began to have fits.

Patient gives a good account of his personal history and habits. His family history is good.

Patient looks a strong, healthy man, but is rather nervous and excitable. The right arm fully as muscular as the left, though he uses the latter rather more. Patient says that the right arm does not feel as strong as the left. There is also a "peculiar" feeling in it which he cannot describe. There is slight contraction of the slips of the palmar fascia going to the ring and little fingers of the right hand, felt most distinctly at the transverse fold of the palm. Patient has a contracted prepuce which closely fits the glans penis. He has also a tendency to inguinal hernia on both sides. (Open inguinal canal probably congenital.)

The fits take place mostly at night, after an emission, and about once a fortnight.

If the patient is awake when the fit is coming on he feels dull. The fingers of the right hand become flexed, and the thumb over them; the arm then flexes till the closed hand touches the right shoulder. The right leg then becomes extended and rigid. The toes are not affected. The respiration becomes rapid, patient hears his heart beating violently, and then becomes unconscious.

When he regains consciousness (which is in about an hour) he finds his mouth covered with saliva, he is very weak and drowsy, and usually falls into a dull, heavy sleep. He has usually to take a rest for a day or two after each attack.

Patient says that if, when he feels an attack coming on, he can have his fingers held out straight and his leg firmly flexed, the fit is checked. At such times he feels his muscles working, but nothing more happens. He says also that if he sleeps on his left side he has no fits.

On December 6, chloroform having been administered, Mr. Miller slit up the prepuce and also forcibly stretched the contracted

palmar fascia, and then put on a splint. Patient was also ordered full doses of potassium bromide. He had a slight fit on December 9. Patient went home on January 16, 1892, having had no more fits. He had discontinued the bromide of potassium, but wore a posterior splint on the right hand to keep the ring and little fingers extended.

Patient returned some months after and reported himself quite well.

This case seems to show an interesting sequence of events. The man was arrested on suspicion and shut up in jail for a night, having been mistaken, he says, for another person. This gave him a great fright, and ever since then he has been nervous and excitable. Ten months before the commencement of the fits he had a quarrel with his parents and left their house. He was much excited at this time, and remained in a state of excitement for two or three weeks, during which time he worked very hard to relieve his feelings. Being a carpenter, the nature of his work obliged him to use his right hand a great deal, and at the end of this period he noticed for the first time a hardness in the palm of the right hand and a contraction of the ring and little fingers. About the same time he had his first fit one day when putting on his coat. After that he had recurring epileptic fits about once a fortnight for nine months, occurring sometimes at night after an emission, sometimes without this association, but always commencing with flexion of the ring and little fingers of the right hand. Once or twice the fits had been arrested by some one forcibly preventing the flexion of the fingers.

Palmar fascia contraction affecting the ring and little fingers was ascertained to exist in the right hand, as also a well-marked phimosis.

The contracted prepuce was slit up, and the contracted palmar fascia was forcibly stretched and ruptured, so that not only was the contraction rectified, but the palm of the hand felt quite soft and natural.

After the operation the patient had one well-marked epileptic fit, and then no more. At the operation the hand was bandaged to a splint so very tightly that the patient complained of the constriction as very painful and irksome. This may have caused the one fit. After the first night the splint was put on more lightly.

Epilepsy from peripheral irritation is not uncommon. The above case is evidently an example of this, whether the exciting cause was the palmar contraction or the phimosis.

Miller has seen a well-marked example of epileptic fits due to phimosis. After circumcision the fits ceased for a time, but returned. The operation had been performed by the thermo-cautery, which at the time was being used for everything (tracheotomy among the rest); marked contraction of the cicatrix occurred (as might have been expected), and paraphimosis resulted. He cut the constriction; the fits again ceased, and have never returned, so far as known.

The author states that he has never seen a case in which palmar fascia contraction was the cause of epilepsy before, but considers that the one recorded is an example.

A CASE OF PARALDEHYDE HABIT.

In the *Edinburgh Medical Journal*, ELKINS records such a case. After detailing it at length, he gives the following summary concerning it:

It will be noticed that many of the bodily and mental symptoms related above, with some notable exceptions, such as the extreme emaciation, the marked effect upon the heart's action, and the abnormally large appetite, are similar to those found in delirium tremens; and, from the chemical relationship of alcohol and paraldehyde, this is what one might expect.

Not knowing what might be the effect upon such a weak subject, after such long use, of suddenly stopping the drug, it was intended to diminish the dose gradually, but the patient's mental condition prevented this arrangement from being carried out. It is possible that the more acute mental condition after admission to the asylum may have been due to the sudden deprivation of the long-used hypnotic. It is doubtful, in the treatment, how much credit should be given to the sulphonal, for it may be that a crisis was just about to take place when the drug was prescribed.

There was great emaciation; anæmia; slight rise of temperature in the evenings.

The heart's action was weak and irregular; pulse intermittent and soft; palpitation.

Stomach derangement, especially flatulence; costiveness; bulimia.

Breath smelt of paraldehyde.

Motor symptoms: General muscular weakness; general tremulousness, especially in tongue, facial muscles, and hands; gait feeble and unsteady; general restlessness. Sensory symptoms: "Strange feelings" running through body. Mental symptoms: Insomnia; great mental anxiety and agitation; discontent; unreasonableness; mental confusion; mental excitement; temporary loss of memory and incoherence of speech; shouting; tendency to

strip himself; hallucinations of sight (he saw "strange beasts"); hallucinations of hearing (he heard his death would appear in to-morrow's paper; he heard his wife had said she wished he were dead); delusions (that he was being poisoned; that his milk was drugged with laudanum; that a woman was in his bed, preventing him from occupying it; that people were tormenting him; that the doctors meant to kill him; that the house was on fire; that harm was about to happen to him). It will be noticed that the hallucinations of sight and hearing and the delusions were all of an unpleasant kind.

The treatment lasted about three months.

THERAPEUTIC VALUE OF SALOL IN CHOLERA DIARRHŒA.

M. Molkowitsch (*Therapeutische Monatshefte*, September, 1893) writes of his experiences with salol in choleraic diarrhœa which he gained in Nioching-Novgorod, Russia, in the summer of 1892. He analyzes one hundred cases to show the length of time which elapses between the occurrence of diarrhœa and the appearance of general symptoms of cholera. Excepting in ten cases, in which the time was only from one and a half to six hours, the interval ranged from six hours to a few weeks. From this fact he assumes that ninety per cent. of the patients, with the greatest probability, could have been rescued if from the very first appearance of the diarrhœa they had received the necessary medical attention; that is to say, if the cholera bacilli in the bowel had been rendered harmless before they had had time to develop the peculiar poison to which the general symptoms of the disease are attributed.

Molkowitsch treated nearly two hundred cases of diarrhœa with salol. He does not assert that they were all choleraic, though he believes they nearly all were. The diarrhœa lasted from a few hours to several days, generally from one to three days. In these cases the stools at first were partly solid, but subsequently watery. In a certain number (about twenty per cent. of the whole number of cases) the evacuations were accompanied with vomiting. Some of the cases subsequently to the beginning of treatment showed symptoms of cholera-poisoning.

Salol was used in all cases. The first dose to adults was 30 grains, but old people and those of weak constitution received only 15 grains. The three following doses of 15 grains he usually gave every three hours, and the later ones every four or five hours. Often the first two to four powders of 15 grains were given every two hours, but the following ones every four hours. In a word, in the first few days patients received about 8 grammes (2 drachms), and in exceptional cases 10 grammes (2½ drachms). If the diarrhœa ceased and the patients felt neither weakness and nausea nor abdominal pain, and were comfortable, the powders were given less frequently,—every four, then every six hours. Usually the evacuations became less frequent within the first twelve hours, and the stools improved in character. If the patient rejected the first powder, a second was given, followed by hot tea.

In addition to the salol medication, patients were usually kept in bed, warmly covered; for pain, hot applications were employed and hot tea with citron given.

With the exception of dizziness and roaring in the ears, he never observed disagreeable symptoms following the use of salol. He regards the fear of carbolic-acid poisoning from salol as unfounded.

If after his treatment the diarrhœa did not cease in two days, the only cause was a failure to carry out his instructions as to diet. He never was compelled to use morphine but once, and then to relieve pain.

CURE OF PLEURITIS, ESPECIALLY VERY ACUTE PLEURITIS.

Dr. Aufrecht (*Therapeutische Monatshefte*, September, 1893) thinks the good results obtained in recent years in the treatment of pleurisy depend in great part upon the use of salicylic acid, of which he first wrote in 1883. His subsequent experience strengthens his earlier recommendation. But salicylic acid, not salicylate of sodium, must be used. The salicylate is weaker and produces marked secondary effects. When the pure acid is given in wafers, patients must always be admonished to follow the dose with a copious draught of water, in order to prevent a disagreeable burning feeling in the stomach.

Aufrecht has adopted the following modification of his former method of giving the salicylic acid: If in the first eight days no diminution of the exudate occurs, do not conclude that the salicylic acid has proved useless, but stop it for a day or two, and then begin again the dose of 6 grammes (90 grains) a day, in divided doses of 1 gramme, and so continue the treatment for several days, with interruptions of a day or two. Aufrecht adds that he has repeatedly found the same method of administration successful in obstinate rheumatic fever.

The best results in the treatment of pleurisy are obtained in cases in which the effusion has rapidly developed and is extensive, and in which the salicylic-acid treatment has been instituted as early as possible.

The author discusses the mode of action of salicylic acid, but reaches no positive conclusions. It is not beneficial in all cases, particularly not in effusions secondary to tumors of the mediastinum and lung, carcinoma or tuberculosis of the pleura, and in effusions of long standing.

As soon as the salicylic-acid treatment proves ineffective, the fluid should be withdrawn by aspiration. Fever is not a contraindication to the operation; on the contrary, the earlier the operation is performed the sooner will the remainder of the exudate be absorbed. The patient should lie upon his back, and Aufrecht selects for the point of puncture the fourth or fifth intercostal space between the anterior and posterior axillary lines. After the operation, patients, without exception, according to their age, receive from 1/6 to 1/4 grain of morphine to allay the cough which ensues from expansion of the lungs. Subsequently a drachm of salicylic acid, on the average, is given daily for several days.

Fraentzel was the first to call attention to a group of cases in which the pleurisy sets in suddenly with violent chill, high fever, and extensive effusion, which rapidly becomes purulent. Such cases have died hitherto, but Aufrecht reports two which were saved by prompt resection of the ribs.

THE TREATMENT OF PNEUMONIA.

This constantly-recurring topic of the treatment of pneumonia shows how the profession feel that in this disease we are often disheartened by our results. In the *Boston Medical and Surgical Journal*, SHATTUCK points out that no method of aborting the disease which has yet been proposed has made good its claims. Pneumonia, like typhoid fever, may abort spontaneously, but we cannot make it do so. Still, it seems that the method of Petresco, of Bucharest, is worthy of trial. Since 1883 he has treated seven hundred and fifty-five cases of pneumonia with very large doses of digitalis from the time they first came under observation. He gives for two or three days a strong infusion, and claims to be able to cut early cases short and to influence very favorably more advanced cases. His mortality now is only 1.22 per cent. He gives from 1 to 2 drachms of the leaves daily, the equivalent of one to two ounces of our tincture. In like manner we have had no distinctly curative treatment, though we are encouraged to hope that the injection of immune blood-serum may prove to be such after further trial. In short, our efforts are at present confined to promoting the comfort of the patient and conserving his forces in every way to enable him to outlive the self-limited disease. This in itself may be much.

For the better application of this general principle it will be more convenient to divide the disease into stages, remembering always that these divisions are arbitrary, and that nature does not seem to feel herself bound strictly to abide by them. Patients very rarely succumb to the stage of invasion or preliminary congestion of the lung with active implication of the pleura. The danger here is not of dying; it is rather of loss of strength, which may be sorely needed later. The indication, therefore, in the ordinary case is to relieve the pain, to put the patient to bed and freely open the bowels, just as the mariner prepares his ship for an impending hurricane. The severity of the pain and any known or ascertainable peculiarity of the patient will decide the character and amount of the means for its relief. In the early days, at least, there can be no question of the safety of morphine, which should be used freely and frequently, hypodermically. Restlessness and an excited nervous system call for morphine nearly as loudly as does pain. Dyspnœa in the average case is at this stage due far more to the pleuritic pain than to state of the lung. But now and then we see a case in which so much lung-tissue is so rapidly invaded that the heart finds it difficult to adjust itself to the changed condition, and greatly oppressed breathing results. In such a case nothing gives such prompt relief as venesection, the freedom of which is to be proportioned to the age and vigor of the patient and its effect on the symptoms. With the veratrum viride treatment of the Philadelphia school the author has no personal experience. If internal antipyretics are to be used at all in pneumonia, it is only during the first stage that they are admissible. Even the best of them is somewhat depressing to the heart.

During the prevalence of the old doctrine of the nature of pneumonia and of inflammation, treatment was naturally addressed to the diseased organ, and antiphlogistics were used externally and internally. We now recognize the fact—or believe it to be a fact—that the cause of death in the second stage is rarely asphyxia as a result of the amount of lung involved. The loss of function of a portion of

the lung plays in most cases a *rôle* which is quite subordinate to that of cardiac exhaustion, dependent probably on the influence of toxines on the innervation of the heart rather than on changes in the myocardium. That it is mainly a toxæmia which weakens the heart, and not simply the mechanically-increased resistance in the right chambers, seems to be proved by the great fall in the pulse, as well as the breathing, coincident with crisis, although the physical signs over the affected lung area may show no appreciable change.

It is, then, the maintenance of nerve-force which we must try to secure. This means the avoidance of every unnecessary fatigue and the administration of the largest amount of the most nutritious liquid food which can be digested, with free ventilation of the apartment. It seems that the poultice and the envelopment of the chest in cotton or wool are relics of the old pathology. The poultice is the worse, as its frequent change involves notable fatigue and its weight is not insignificant. The author warmly recommends plenty of fresh air and sunshine. Morphine should be used more freely in the second stage than is customary. Here it is not called for by pain so much as by restlessness, cough, and sleeplessness. In any given case we must try to estimate the proportion of danger from respiratory failure. The smaller this danger the more freely can we use morphine, which will do more good in resting the nervous system than harm in other ways; and even in cases where the danger of respiratory failure cannot be disregarded, but morphine is indicated on other grounds, the inhalation of oxygen enables us to give morphine when we might otherwise feel compelled to withhold it. The writer does not recommend oxygen treatment, having in a considerable experience seen only one case—that of a Harvard student—where it gave marked relief, and even here the patient's age should have insured recovery. Our experience with this gas is now sufficient to enable us to estimate its value better and to use it more intelligently than a few years ago. Physiologists kept it out of use longer than we should have allowed them to do, saying that the consumption of oxygen is no greater when the pure gas is inhaled than it is under ordinary conditions. Even if this is true of the well, it does not follow that it is also true of the sick. It is probable that to-day clinicians are agreed that oxygen may be useful when a sufficient amount of air to arterialize the blood is prevented from reaching the alveoli, a condition which is present in some cases of pneumonia, as the result of excessive secretion in the bronchial tubes in combination with the lung consolidation. Cyanosis, therefore, is the best single indication for oxygen. In such cases it should be used early and as freely as the purse of the patient will allow. Unfortunately, it is still a very expensive remedy; but its usefulness is wider than would appear from the above. Shattuck has seen refreshment, quieter respiration, a fuller pulse, and diminished restlessness, perhaps sleep, follow oxygen, even where cyanosis was absent or slight. Perhaps the gas acts as an aid in the combustion of toxines, all compounds of unstable character. The other chief means of stimulating the flagging heart, as reflected in the pulse and the character of the sounds, are alcohol, strychnine, cocaine, digitalis, and other heart tonics. Alcohol should be mentioned as very useful when the indications for its employment are present. Strychnine has grown in favor of late years, and justly. It is best given hypodermically, and, in severe cases, to the limit of toleration, $\frac{1}{40}$ to $\frac{1}{20}$ grain every three or four hours. H. C. Wood speaks highly of cocaine as an adjuvant to strychnine.

All writers advise and all practitioners use digitalis or one of its congeners, if there are any indications of a failing heart. The writer has used it constantly, but the rationale of its usefulness is not clear as it is ordinarily given. Perhaps we do not use it in large enough doses. It should probably be used hypodermically more than we do. He has seen this year prompt and distinct effect in several cases follow hypodermics of 30 minims of the tincture. Petresco's results are confirmatory of the idea that our doses of digitalis are often insufficient.

With the cold bath and cold wet pack, as remedies against high fever, delirium, and other nervous symptoms, the author has but slight personal acquaintance. A period of the disease which we all recognize as one of much danger in some cases is that immediately following the crisis. Exhaustion or collapse at this time calls for rapid stimulation; alcohol and ammonia internally, heat to the surface, brandy and ether under the skin.

In cases terminating by lysis, and in delayed resolution, a supporting treatment is to be carried out, according to the indications presented by the case in hand. The frequency of empyema as a sequel to pneumonia is never to be forgotten, if for no other than a therapeutic reason.

Lépine has recently employed with success injections into the thighs or arms of oil of tur-

pentine, when he feared that gray was passing over into yellow hepatization. Fochier first suggested and practised this method in puer peral septicæmia, having noticed that improvement took place when a focus of pus was established. The turpentine produces an abscess, —"of fixation," Fochier terms it,—which can be opened later. Dieulafoy and Bard have each practised this method in pneumonia, with recovery in both cases. Others in France have also used it a few times.

In three desperate cases in the author's service at the Massachusetts Hospital, last winter, he had turpentine injected, in one case on the ninth, in two on the seventh day of the disease. All three died, as seemed certain they would, whatever was done or not done.

For therapeutic purposes, cases of pneumonia may be divided into three classes: first in frequency are those cases which will recover under any treatment or no treatment, unless they are grossly mismanaged; second, those which will die in spite of any and all treatment known at present; third, those in which judicious treatment may turn the scale.

Our object is constantly to strive to enlarge the third class at the expense of the second. Thus far our efforts have been unsuccessful enough. One method of curative treatment has been recently introduced which can claim an encouraging though limited success in practice, as well as foundation in analogy,—with tetanus, for instance. Only one case has been reported thus treated in this country, but it would seem our duty to lose no further time, and Shattuck proposes to test the method in his wards next autumn and winter.

He refers to the injection of blood-serum from a human being who has recently passed the crisis of pneumonia, or blood-serum or fluid derived from animals rendered immune to experimental pneumonia by the injection of pneumococcus cultures. The purpose in this method is to induce the crisis artificially, and that of thirty-nine cases thus treated all save one recovered. Whether the pneumotoxin and antipneumotoxin theory of its mode of action is final or not, remains to be seen. In the sole American case defibrinated blood was used, with results which do not encourage a second trial.

SALOL AS AN INTESTINAL ANTISEPTIC.

In the *Practitioner*, SYMPSON publishes a useful paper on salol as an intestinal antiseptic. He recalls the well-known fact that, after having been swallowed and passed through the stomach unchanged, it is split up in the duodenum by the pancreatic juice into its constituents, salicylic acid and carbolic acid. Their action will be alluded to more in detail later on, but it may here be said that they are thrown out of the body partly by the kidneys (the urine not infrequently being blackened by the carbolic acid) and partly by the intestinal tract in the fæces. From experiments on dogs whose pancreases have been extirpated, there seems to be reason to think that salol can be absorbed from the intestine without the intervention of the pancreatic juice. As to its action on digestion, there are different opinions, some authorities saying that it unsettles the digestive processes and that it actually sets up gastric trouble. These statements refer to its action in typhoid fever, which will be mentioned presently; other observers have, however, noted directly the contrary results. Sympson has personally taken salol in 5-grain doses three or four times a day, both before and after meals, when he has been perfectly well, without experiencing the slightest interference with digestion or appetite. The following experiments will show, however, that salol does appreciably affect the different digestive ferments so far as regards their rate of action:

Experiment 1.—Ten grains of arrow-root were boiled in two ounces of distilled water, cooled down to 100° F., and ten minims of Bleasdale's pancreatic essence added. The solution became perfectly clear. When one grain of salol was added before boiling, the starch required twice the amount of pancreatic essence and an hour's more time (being kept at the same temperature) before the conversion was complete. If the salol was merely added with the essence, it made no difference. The same results followed, only less marked, from the use of half a grain of salol.

Experiment 2.—Five grains of boiled and finely-chopped-up white of egg were pounded up with the following mixture: Benger's liquor pepticus twenty minims, dilute hydrochloric acid ten minims, and two ounces of distilled water. For four hours this mixture was kept at a temperature of 100° F. The albumin had entirely disappeared and the mixture gave evidence of containing peptones. The addition of half a grain of salol checked the process considerably; at the end of the same time there were several fragments of egg undissolved, and two or more hours were required for complete dissolution. Both these sets of experiments were frequently repeated, and the results were distinct and constant.

Before finishing this brief account of salol, it

may be said that it has been accused of producing herpes and of increasing the delirium which frequently occurs in the course of typhoid fever. Sympson has not noticed this latter himself in either complaint or when he used salol in cystitis.

In normal digestion the semi-digested acid chyme is poured out from the pylorus into the small intestine, to be exposed to the influence of the bile and pancreatic juice. These complete the digestion of the various food-stuffs, and some of the products of this digestion are due to the micro-organisms which are present in the intestine. Their work seems to be modified or kept in check by the presence of bile, for, as Foster remarks, "Bile possesses some antiseptic qualities. Out of the body its presence hinders various putrefactive processes; and when it is prevented from flowing into the alimentary canal, the contents of the intestine undergo changes different from those which take place under normal conditions, and leading to the appearance of various products, especially of ill-smelling gases."

The stomach undoubtedly is responsible for some cases of dyspepsia where the chyme is passed on to the intestines in an imperfectly-prepared manner, which produces duodenal disorder. But in the following class of cases there is evidence that occasionally the secretions poured into the intestine are at fault. The patient is probably of a "bilious" temperament; he may have a clean tongue, with great loss of appetite, and consequent loss of flesh; no pain during a meal, but coming on about two and a half to three hours after. Very likely he is constipated, and when his bowels are relaxed the motion is grayish white. As a rule, he will not suffer from nausea, only a little retching sometimes, and instead of the gas being acid, as it so often is, it may be quite alkaline and "soapy," as a patient once told me. The seat of pain is the lower part of the abdomen, and is relieved by passing wind. There will, perhaps, be a slight yellowness, hardly amounting to actual jaundice. These cases belong to the same class as those described by Dr. Allchin in his lectures on duodenal indigestion. Sympson believes that the symptoms are due to excessive and faulty fermentation in the small intestine, owing to alteration in character and amount of the ordinary digestive fluids, and more particularly of the bile. Dilute nitro-hydrochloric acid to these patients, sometimes combined with liquor pepticus, to help the stomach do its work, has made little or no difference in their condition, and opium in any form by the mouth has not given that speedy relief which it does in gastric affections. So, latterly, the writer has been in the habit of beginning with 4 or 5 grains of calomel, and following it in an hour or two's time with 10-grain doses of salol every four hours. This, to use the language of a somewhat enthusiastic patient, "acts like a charm" when taken about one and a half hours after meals. The pain ceases, the swelling of the abdomen does not appear, the appetite improves, and, more important still, the wasting—probably due to the non-digestion of a large part of the food—departs.

Salol has also been found exceedingly useful in a form of infective diarrhœa. Some months back the writer saw a family in a village near Lincoln who all had diarrhœa, passing dark-brown watery stools five, six, seven, or eight times in the twenty-four hours, attended with severe abdominal pain. In a few days several of the inhabitants of the village were seized with the same complaint, and every one had been into the first-mentioned house. Several more got it from the second source of infection. The probable origin of the disease was not ascertained. Opium alone in some of the cases was tried, but its action was far inferior to that of salol, whether combined with opiates or not.

In cases of ordinary diarrhœa, too, there are few remedies which more speedily check the flow and the pain than 10-grain doses of salol. Some years ago, in the *Lancet*, Sympson advocated giving glycerin of borax in the diarrhœa of infants, believing that undue fermentation in the intestines was the *fons et origo mali*. It does answer well, but salol is to be preferred in the severer cases, in doses proportionate to the age, as it is a little more certain, more antiseptic, and almost as agreeable to take.

Lastly, he has been using salol exclusively in typhoid fever, not so much on the idea of combating the specific poison, but of cleaning and keeping clean the intestinal tract, and so subduing the irritation of the glands of Peyer's patches and other ulcers there, and that caused by the secretion from these ulcers in the intestine. Salol also prevents the excessive formation of wind, which is sometimes so vexatious a trouble to the patient. Salol brings the temperature down generally one or two degrees, causes abundant perspiration (this can be readily combated by giving oxide of zinc, tincture of belladonna, and some quinine in a mixture), reduces the number of stools from twelve to fourteen in the twenty-four hours to three or four, and, when they are offensive, deprives them of any odor whatever. No bad effects

were noticed with regard to its action in producing delirium. Its use was continued in typhoid fever for about a week after the disappearance of diarrhœa. It was always given in 10-grain doses, suspended by means of compound tragacanth powder, at first (in typhoid fever and other complaints) every four hours, then every six, and for the last week three times a day. It was always given after food.

PROPHYLAXIS AND TREATMENT OF DIPHTHERIA.

ROBINSON contributes to the *New York Medical Journal* a long paper on this subject, of which the following relates to the treatment of the disease. He thinks that, despite the advances made during the past few years in our knowledge of the pathogeny of diphtheria, as is shown especially in bacteriological investigations of this disease, the treatment of it is still uncertain and unsatisfactory. The really bad, malignant cases frequently progress inevitably to a fatal termination, and in some of them it is doubtful if any treatment thus far tried will arrest their march for a while or ultimately cure them. Such appears to be the testimony of some excellent observers of wide experience. These fatal cases doubtless become so by reason of the toxic character of the epidemic and the extreme susceptibility of some patients to the virulent poison of the disease. It is generally admitted, however, that those patients continue to react most favorably who are actively and judiciously treated from the inception of the disease. The mode of treatment seems to vary considerably with different observers. There is, however, a tolerably large and increasing number of eminent practitioners who evidently consider proper local treatment of the highest importance. Of these, many use drugs internally, with the conviction of being helpful to the patients.

Among them may be cited Jacobi, who thus speaks of the use of bichloride of mercury when it is given internally: "That its beneficial effect is not at all limited to the cases of laryngeal stenosis, but also those of sepsis. Indeed, in a great many such cases it has been administered and found effective." On the other hand, Osler writes, that "we are still without a remedy capable of combating in any way the effects of the poisonous toxalbumins." Robinson did not see from bichloride of mercury "the specially good effect which many writers describe." The latest report, moreover, of one of the large German hospitals is to the effect that no internal treatment was employed, and the results obtained with severe cases of diphtheria have been quite favorable as compared with numerous antecedent or contemporaneous results accomplished elsewhere. The report just referred to is that of the Friedrichshain Hospital in Berlin, where it is stated that "during the last two years no drug treatment was instituted," and yet there were sixty-four per cent. of cures. This experience is also corroborated by that at the Willard Parker Hospital, where, according to Dr. William H. Park, "the only constitutional treatment is to give alcoholic stimulants throughout the course of the disease to those showing any tendency to heart-failure." The great difficulty in obtaining the best effects of local treatment is due to our inability to reach directly all the parts involved with topical applications. Ordinarily it is believed that these applications should be distinctively antiseptic in nature. In regard to the particular drug employed, the strength, manner, and frequency of its use, there are great differences of opinion. Of course, the manner in which treatment is conducted must differ somewhat with adults and children, the latter being less amenable to reason and less willing, therefore, to submit quietly to the necessary manipulations for the cure of the disease. Most observers are united in the belief that our main efforts should be directed towards destroying or lessening the vitality of the bacilli, diminishing the local spread of the disease, neutralizing the toxic results of absorption of the poisons produced by the bacilli, and support of the patient's strength with food and alcoholic stimulants. Inasmuch as the majority of cases of diphtheria occur among children, we must first consider how such cases may best be treated. This will depend upon whether the disease affects the nose, the pharynx, the larynx, or all these organs. If it attacks the pharynx, and as soon as we have the first local evidence of this implantation, mild cleansing, disinfectant solutions should frequently be employed. Depending upon the age of the child and its degree of weakness or strength, the throat must be treated with sprays, with irrigation, or with gargles. Sometimes one, sometimes the other method is most successful, according to the age and willingness of the little patient. In this connection the fact should be emphasized that it is more useful and satisfactory to disinfect and cleanse the throat by means of sprays, employed not directly through the mouth, but indirectly through the nose. In this manner nearly every portion of the diseased membrane is brought into more complete contact with the medicated solution than in any other way, and with less distress

and fatigue to the sick child. Whenever the spray fills the nasal passages, it will almost inevitably, in the large number of instances, reach almost the entire naso-pharynx, the middle pharynx, and portions at least of the fauces and tonsils. Through efforts of gagging or choking by the patient, the latter parts are surely cleansed and disinfected. Nasal sprays should be rather coarse, never very strong, and should be repeated every hour or two. The frequency of their use should depend somewhat upon the malignancy of the case, the thoroughness with which they are employed, and the time of day or night. In this relation the author and Dr. C. A. Siegfried are in accord. The latter writes, "In the very young, sprays can be introduced through the nostrils to the back of the throat;" and the treatment of the Willard Parker Hospital is the same, where "all patients have their nostrils syringed with a bichloride solution." Dr. A. Jacobi also states, with his very large experience to guide him, as follows: "Gentle nasal injections reach the important part of the pharynx better than injections in the oral cavity." "Nasal injections must be made early, frequently, and persistently." In speaking of nasal and naso-pharyngeal diphtheria infection, Dr. Jacobi affirms emphatically that "nasal injections alone are beneficial, and sometimes so to a remarkable degree." Immediately after the use of the spray, a strong disinfecting solution should be applied directly to the diphtheritic patches in the throat by means of a swab or brush. The sprays for the nose must be preferably made from mild solutions of carbolic acid with lime-water, borax, or bicarbonate of sodium, or else from very dilute solutions of bichloride of mercury. The solutions of carbolic acid should not be stronger than one or two per cent.; those of mercury, 1 to 4000, 8000, or 10,000.

In this connection should be mentioned that the *résumé* of the collective investigation of the THERAPEUTIC GAZETTE (1883) is not favorable to the use of carbolic acid. It is regarded as a useless and positively harmful application. Jacobi seems to support this view, despite the fact cited by him that Prudden found that a one-sixth-per-cent. solution suffices to stop the emigration or leucocytes.

From time to time, or about once every four hours, it is wise to give the fauces, tonsils, and pharynx a thorough, direct cleansing with this same spray or by means of a syringe. The local applications with a brush or swab to the back of the throat should be made with a solution of bichloride of mercury (1 to 500, or even 1 to 250). During these necessary manipulations the child should remain in bed or be held on the lap of the nurse, and wrapped in a blanket. Dr. Billington thus describes how nasal syringing can best be accomplished: "The assistance of two persons is required. The child is seated across the lap of one of these persons, who secures his hands with one of her own, and with the other holds the basin to receive the discharge. The other person stands behind the child, takes his head between the palms of her hands, and, leaning forward, holds it firmly against her breast. A third person, who should, when possible, be a physician, can then easily make the injection into the child's nostrils without the danger of injury to them by its sudden movements." To show how opposed is the experience of competent observers may be cited Jacobi's judgment, which is that "it is acknowledged as a positive rule among all good practitioners that no child must be taken out of bed for the purpose of injections, that the preparations for the procedure must be made out of sight, and the injections given quickly but gently, in a recumbent or semi-recumbent posture." Subsequent to the cleansing and swabbing, the child should be allowed to rest during a half-hour or an hour. Then a dose of the tincture of the sesquichloride of iron in glycerin and water, or a tablet of bichloride of mercury in solution in water or milk, should be given, followed by liquid food and alcoholic stimulant. The amount of the tincture of iron given should be from 1 to 2 drops for every year of the child's age; that of mercury, in tablet form, from $\frac{1}{100}$ to $\frac{1}{50}$ grain. The best old brandy, in amount proportionate to the age and condition of asthenia, should be given in milk, alternated occasionally with beef-juice or concentrated broths of mutton or chicken. Meanwhile, of course, the antiseptic vapors (referred to under prophylaxis) of turpentine, carbolic acid, and oil of eucalyptus should be kept in use more or less constantly. They must also be directed in such a way from a croup-kettle under a hood over the child's head, or a tent around the crib, with suitable supports and an opening for ventilation, as to allow the child to inhale the vapors sufficiently to obtain an appreciable medicinal effect in this manner.

Robinson's method is based upon a judicial estimate of the conditions involved, and with due regard for the knowledge thus far acquired through experimental research and clinical experience. There are many other agents, as we all know, in the nature of caustics, astringents, disinfectants, dyes, solvents, etc., which have been praised by different observers for their

curative action in diphtheria. Among them all, none seems to merit confidence as much as those already mentioned, especially when they are employed after the manner indicated. Many practitioners laud their use more than they do other agents of a similar or different order. Personally, the author believes that freshly-powdered cubeb has a very marked action in changing favorably the character of the membranous deposit and in lessening the accompanying catarrhal inflammation of the fauces, which always is allied with the evident diphtheritic manifestations.

To make applications more frequently to the nasal passages or to the throat than the writer advises is unnecessary and often injurious. They frighten and exhaust the child too much. They do not allow it to take and retain sufficient nutriment. If the solutions are made stronger, they are too irritating to be frequently repeated, and perhaps render the mucous membrane of the parts affected more prone to become involved by the encroachment of the disease than they otherwise would be. The failure to cleanse the nose and naso-pharynx efficiently is one reason why an otherwise good method of treatment is not oftener followed by the amelioration or recovery of the patient. The cleansing of the nasal passage is carried out whenever the presence of diphtheritic membrane in this organ is assured. In cases, however, in which this membrane is not apparent it is too often neglected. Absorption of many poisonous products is thus frequently permitted when it might be in part prevented. Many cases, no doubt, become much more serious through the omission referred to. Is it not true that absorption from the nasal passages takes place more readily than from the fauces? Do not the most serious cases usually show extension, sooner or later, of the diphtheritic process to these passages? Why not, therefore, avoid or prevent this grave development, if possible, by rational means? In regard to the frequency of local applications, it is again urged very strongly not to employ them more frequently than above advised. Meddlesome or too much interference is ultimately injurious in diphtheria, and mainly because it exhausts vitality and prevents essential recuperation by means of rest, food, and stimulants. Applications of undue strength frequently made to the nasal passages occasion pain and irritation, which increase notably the distress of the patient, with no compensating return, and make the membrane, by possible abrasions, more susceptible to the virulence of the disease. Whenever the symptoms point, unfortunately, towards the involvement of the larynx, we should rely far less upon the utility of disinfecting sprays than in nasal or pharyngeal diphtheria, inasmuch as they penetrate very little, if at all, within this organ. Antiseptic vapors, the internal use of the medicines which have a favorable constitutional effect, are here more to be trusted. In the event of considerable laryngeal obstruction, we must make use of vomiting agents,—such as turpeth mineral, alum, ipecac, —if the child's strength permits, and follow their use with active stimulation. Occasionally false membranes from the larynx are thrown off by this means, and great temporary relief is obtained. At times no remedial effect is produced, and the child is only weakened and distressed to no purpose, for the laryngeal obstruction after their use is quite as great as previously. Under these circumstances we must look to intubation or tracheotomy as our sole remaining means of help.

In support of his views, Dr. Robinson quotes the following: "At a meeting of the Michigan Medical Society the secretary demonstrated, in a tabulated statement, accompanied with a graphic chart, important facts in the various outbreaks reported by local health officers during the year 1886. In 102 outbreaks, in which there was neglect of one or both of these measures, the average number of cases to the outbreak was a little over 16 and the average number of deaths 3.23, while in 116 outbreaks in which both were enforced the average number of cases was 2.86 and that of deaths .66. In other words, these simple precautions reduced the number of cases occurring during the year by 1545 and the number of deaths by 298."

Finally, Dr. Robinson closes his article with the following from the last published paper of Dr. William H. Park. Dr. Park writes, "The making of a true diagnosis in every case is not of scientific interest only, but of great practical importance. Care for the public health requires that every case of possible diphtheria be properly isolated and treated as diphtheria until all doubt is removed. Regard for the patient demands that no suspicious case that is not diphtheria be regarded and treated as such any longer than the fourteen hours absolutely necessary for making the diagnosis. In doubtful cases, therefore, it is the duty of physicians to obtain a diagnosis by the use of cultures. A correct diagnosis will also be a satisfaction to them, and will be a help in prognosis and treatment, and of great value in the diagnosing of future cases. The efficiency, simplicity, and cheapness of the methods for making an early

diagnosis in doubtful cases would seem to render its employment by health authorities among the poorer classes advisable."

INTRATYMPANIC OPERATIONS.

In a valuable paper in Buck's *Reference Hand-Book of the Medical Sciences*, September, 1893, Dr. E. B. Dench details the various measures which have had trial, generally brief and unsatisfactory, for the relief of middle-ear lesions. The present status of excision of the drumhead and ossicular chain, wholly or in part, is well presented, with the weight of this earnest worker in its behalf. His operations now number forty: eleven in non-suppurative cases, with great improvement in hearing in six and moderate gain in four. In the twenty-nine suppurative patients, hearing was often good, but was improved in eighteen and perhaps lowered in one. The discharge stopped completely in fifteen cases and lessened in nine, while five were still under treatment. The duration of observation is not stated; and while the writer regards his results as less good than he could wish, there is a chance that later study would further reduce his satisfaction, the additions from the category of "unhealed" being probably more than offset by relapses among those rated as cured. His quotation of other men's results is at times misleading, for nineteen of the forty-two cured cases of the seventy-five in Ludwig's report had a simultaneous trephining of the mastoid, without which they would doubtless have fallen among the failures, as did others later cured by this operation. The fact that Dr. Dench has been doing but a dozen or so excisions each year indicates that he selects his cases with more care than many of his colleagues. He gives a truer representation of the matter than some more extended series, where the operation was often a first rather than the last resort.

CATARACT EXTRACTION WITH THE IRIS RETRACTOR.

Dr. Francis Valk (*New York Medical Journal*, October 28, 1893) describes his method of operation as follows:

At the time when he is ready for the operation he instils a sufficient quantity of a solution of cocaine (four per cent.) to render the cornea anæsthetic, but not to dilate the pupil. The patient is then placed on a steady table or bed, with a good clear light on the eye, and the lids are opened with a speculum. The eye is then washed with a solution of boric acid, while his instruments are all placed in boiling water and then on a clean towel and covered until wanted.

Section.—This he considers the most important part of the operation, as upon a good section, he believes, depends the ultimate success. This should be in the same plane, except at the finish. He wishes to avoid the conjunctival flap, and by the perfect coaptation of the wound in the cornea we may avoid slow healing, septic infection, and prolapse or incarceration of the iris. He makes the section either upward or downward, according to the eye to be operated upon, as upward in the right eye, downward in the left, or, if the operator is ambidextrous, then both sections may be made upward, as he considers the upward section preferable. He prefers, in making his section, to cut always towards himself, for in so doing a much smoother and clearer cut is produced. He always makes the puncture and counterpuncture wholly within the corneal tissue, through its transparent margin about one millimetre from its periphery, and so that the cutting edge of the knife will just cover the pupillary edge of the iris on the side towards which he proposes to make the section. If possible, he rapidly makes the section of the cornea with three distinct cuts: first, carrying the point of the knife, as soon as the counterpuncture is made, upward and forward, cutting one side of the cornea; then the heel of the blade is drawn upward and backward, so cutting the opposite side; then, turning the knife on its long axis, the section is completed with the third cut by pushing the knife steadily forward until released. He thinks De Wecker, of Paris, first suggested this method, and he prefers it to all others. As he completes the section in the above manner, the knife comes out some distance from the scleral junction, leaving room for the iris to be tucked in when drawn back by the retractor.

At this time prolapse of the iris may occur; if so, it must be returned with the spatula if we wish to save the iris; but if not, then it may be drawn out and cut off if we decide an iridectomy is best. Another complication that may occur at this stage, particularly in very old people, is the rupture of the capsule, or the zone of Zinn, with the presentation of the lens at the section; if so, it must be removed at once by pressure on the cornea. He is inclined to think that, should there be any tendency to prolapse at this stage, it is better to perform an iridectomy at once to prevent any future prolapse as the healing process proceeds. If no complications arise, he then proceeds to open the capsule by a peripheral incision, passing the

cystotome inward to the pupillary space, then under the iris, and sweep it around beneath the edge, so as to cut the capsule in more than one-third of its periphery on the same side that the section has been made.

The eye being now ready for the extraction of the lens, it is grasped by the fixation forceps, directly opposite the section, and held steady by a careful assistant. He now takes the retractor in the left hand, and, with the blades closed and the set-screw so arranged that the blades will open to about the diameter of the pupil, he insinuates the ends through the section to the pupillary space. The blades are now opened by pressure and the iris drawn back and tucked beneath the edge of the lower corneal section. Holding it steady in that position, a slight pressure is made on the opposite side of the cornea by a spoon or hook, causing the lens to rise up and easily pass out over the ends of the blades. As it does so, and as soon as the lens presents itself at the section, the retractor is pushed slightly inward, at once releasing the iris. The retractor is then generally removed, with the lens lying in the concavity of the blades. As the lens clears away, we find the iris back in its position, not injured in any way, nor has it been exposed to the air, as may occur in simple extraction.

In case there should be any cortex remaining, which he does not think will be absorbed or will interfere with the vision, he reintroduces the retractor, and, drawing back the iris again, these masses are easily pressed out with the spoon. This completes the operation, and, the section being in perfect apposition, the speculum is removed, the eye gently closed, and the bandage applied.

MASTOID TREPHINING AND THE SURGICAL ANATOMY OF THE TEMPORAL.

In a paper read before the Philadelphia County Medical Society, May 10, 1893, Dr. B. A. Randall remarks upon fifty cases operated upon in his previous four years of practice, with the important claim that they were from among upward of two hundred cases in which the symptoms of mastoid disease had been threatening. Nearly three-fourths of the patients had been brought to resolution without operation, hot syringing and rapidly-changed fomentations, with *rest in bed*, being his principal reliance for the relief of pain and inflammation. But two cases of the fifty had been lost, only one with room for blaming the operation; and the cure in the remainder had generally been prompt and lasting. The utmost thoroughness in removing all necrosing tissue, in the directions where this was safe, was claimed to be the true conservatism, but that the violence to the organ of hearing should be the minimum possible. Safety should never be sacrificed to brilliancy, and in the more precarious regions too little should be done rather than too much.

In the supplement of the *Reference Hand-Book* above referred to, the same writer gives a brief and summary view of mastoid anatomy, confirming decidedly the claim of those who insist that every operation should be done as though the bone was known to be of the most dangerous type. The lateral sinus, which generally approaches within some six millimetres of the surface at a point corresponding with the insertion of the auricle, and some twelve millimetres back of the meatus, may be much more anterior or superficial, leaving absolutely no room for trephining the bone, and this in any type of long or broad head and on either side, contrary to the claim of Koerner that it is generally much safer on the left and in the long, dolicocephalic skull. The middle cerebral fossa is also quite as variable, and may have its floor as low as the upper margin of the auditory meatus. It was never lower in the five hundred skulls measured; maximum or minimum height was found in every type of cranial form. Mastoid trephining should, therefore, be done only with an instrument permitting every stage of the penetration to be closely observed, as in chiselling; and the point of entrance should be as close as possible behind the spine, which can almost always be found marking the posterior margin of the auditory meatus. The surface should be closely inspected, after thorough baring, for any sign of a superficial sinus. The channel should lie close behind the canal, and not rise above its roof except as the antrum is approached. The inner wall of the antrum with the facial canal is probably never less than fifteen millimetres from the surface, so penetration to this depth in the prescribed direction can hardly reach the labyrinth or facial nerve. In children the antrum is more superficial the younger the child, and the sinus and cerebrum are absolutely as well as relatively less exposed to injury in a properly-executed operation.

INDIRECT MASSAGE OF THE LENS FOR THE ARTIFICIAL RIPENING OF CATARACT.

Dr. Edward Jackson (*New York Medical Journal*, October 28, 1893) describes his experience with Dr. Joseph A. White's method of

ripening immature cataract, a method suggested by Dr. T. R. Pooley, of New York. Seven cases are reported. The following is the method of operating:

After the full dilatation of the pupil and the free instillation of cocaine, the anterior chamber is tapped with a paracentesis needle or broad needle, the incision being kept open by the point of the needle until the aqueous has been completely withdrawn with some little pressure of the fingers through the lids upon the globe. He uses the fingers for fixation without a speculum. Then a tortoise-shell spatula is pressed upon the cornea within the area of the pupil and rubbed around in a circle and then in radiating lines, stroking from the centre towards the periphery of the cornea. During this latter manipulation the margin of the pupil will be seen to retreat before the spatula, so that a large part of the anterior surface of the lens can be acted on without pressure upon the iris. The manipulation is continued a minute and a half to two minutes and a half.

The *after-treatment* consists of closing the eye for a few hours and the subsequent instillation of a mydriatic until the eye is free from hyperæmia. The preliminary instillation of cocaine is repeated three or four times, using it more freely than he would for cataract extraction, with the idea of rendering the cornea more flexible.

To summarize his conclusions with reference to this method of ripening cataract:

It seems more certainly efficient than Förster's.

It is almost entirely free from danger.

It is probably a better means of avoiding prolonged practical blindness than the extraction of the immature cataract.

A DEPARTURE IN THE OPERATION OF CANTHOPLASTY.

Dr. Kenneth Scott (*Ophthalmic Review*, 1890) writes as follows:

The usual classical operation of canthoplasty cannot always be relied on as an unfailing remedy in cases of blepharophimosis or blepharospasm. More particularly is it true in those cases where the condition is an extreme one, or where there is, or has been, a considerable amount of inflammatory action in the eyelids, accompanied by thickening and very often by hypertrophic degeneration of the palpebral conjunctiva. These are the cases in which the operation of canthoplasty is most often called for, and when the one which is usually described has been performed there is often a slight reactionary œdema, the lips of the wound approximate, and in spite of every preventive effort a reunion of the opposing surfaces occurs. Sometimes, on the other hand, the middle suture, which is placed in the outer angle of the palpebral fissure, tears its way through the conjunctiva, and the eye returns again to the condition it was in before operation.

The following is the manner of procedure which he now invariably employs: The outer canthus is divided with scissors in the usual way; a spring eye-speculum is then introduced between the eyelids, and the portion of conjunctiva which is opposite the centre of the wound is freed by scissors from its attachment over the globe, almost as far as the corneal margin. The free edge of the conjunctival flap, still held in the fixation forceps, is attached by a fine silk suture, as in the usually described operation, to the apex of the skin wound, when it will be found that there is not the slightest tendency towards dragging. The speculum is removed, and the conjunctival edge is then sewed in turn to the opposing cut margins of the upper and lower eyelids. A silver-wire suture, which has been thoroughly softened in the flame of a spirit-lamp, is then passed right through the substance of the upper eyelid, from the skin to its conjunctival surface, near to its ciliary margin, and a short distance from the cut surface of the canthus. It is fastened by twisting lightly, so as to avoid constricting the tissues. The needle end of the suture is then passed through the substance of the eyebrow, directly over the outer third of the eyelid, and is fastened by twisting it there to the other free end brought up to meet it. The lower palpebral part of this strand of silver wire is then curved outward with dissecting forceps, so as to evert the outer end of the new lid margin and prevent all possibility of its approximating to the opposing cut edge of the lower eyelid.

He has never known any suppuration or other irritation occur if the parts have been thoroughly cleansed previously with some efficient antiseptic lotion, and after operation an antiseptic dusting-powder, such as iodoform and boric acid in equal parts, applied.

The silver-wire suture should not be removed until it is seen that the wound between skin and conjunctiva is quite healed; this usually takes place about the fourth day. The operation can be performed with cocaine quite easily, except in the case of children, when a general anæsthetic is usually required.

THE THERAPEUTIC CONTRIBUTIONS OF OPHTHALMOLOGY TO GENERAL MEDICINE.

ARGYLL ROBERTSON, in an address delivered before the Ophthalmological Society of the United Kingdom at its first meeting in the session of 1893–94 (*British Medical Journal*, October 28, 1893), discusses the subject contained in the title. It is interesting to note, among other things, that he points out the advance which ophthalmology has made in the treatment of headaches, or in functional nervous disturbances so grave that they lead to the suspicion of serious cerebral lesion, which are yet remediable by suitable glasses and the performance of an operation on the muscles to overcome some latent tendency to misdirection of the eyes. The value of shortening the tendon is referred to, as well as advancement, the opinion being expressed that, although the general surgeon has long been accustomed to deal with muscular deformities by cutting through tendons, he is only now learning to deal with elongated and weakened muscles after the methods of ophthalmic surgeons.

The undoubted value of mercury in the treatment of syphilis is insisted upon, and the astonishing results by the use of this drug on syphilitic eye-affections, which may be watched with accuracy, is pointed out as proof of this assertion.

Local depletion, for example, in acute iritis, cyclitis, and even glaucoma, is commended, and general medical practitioners are urged to investigate its undoubted value in ophthalmology before giving it up in practice. In like manner, counter-irritation and blisters are commended, and the lesions presented to an ophthalmic surgeon are quoted as a therapeutic testing-ground for such medication. The following method of counter-irritation is the one employed in Edinburgh, and is most efficient, according to Robertson. It consists in moistening the upper lid and then rubbing a stick of lunar caustic three or four times across the moistened surface. Within a few minutes a burning pain is experienced in the lid, the skin becomes reddened and the lid œdematous, while the epidermis, at the point on which the caustic was applied, presents an ashy-gray tint. The severe pain lasts from half an hour to an hour, but the surface of the lid remains tender to the touch for two or three days. A black crust forms on the surface, but is cast off in six or eight days and leaves no permanent mark behind. The experiences of ophthalmic surgeons with nitrate of silver confirm a fact—now many times proved—that it ranks high among the various antiseptics.

THE EFFECT OF CORRECTING ERRORS OF REFRACTION IN EPILEPTICS.

The following abstract of a paper presented by DR. JOHN HERN to the Sixty-first Annual Meeting of the British Medical Association appears in the *British Medical Journal*, September 30, 1893:

Although it would be obviously incorrect to state that because an epileptic had an error of refraction it must be the cause of his epilepsy, yet it appeared probable that in some cases, at any rate, the eye-strain necessary in hypermetropes and others to focus a clear image on the retina might be the starting-point of the epileptic attack. At a meeting of the Ophthalmological Society early in 1893, Dr. Hern had shown the first case he had met with in which true epileptic seizures ceased on a correction of hypermetropia by glasses. In this case the patient had no "fit" if he used his glasses for reading, but if he neglected this an attack of true epilepsy occurred. Since then Dr. Hern had met with three other successful cases.

MR. HARTRIDGE thought that if the epilepsy were due to such a peripheral cause as might be produced by excessive or irregular action of the ciliary muscle, then the more completely this strain was relieved the greater the advantages which might be hoped to result.

MR. SYDNEY STEPHENSON urged the necessity of carefully distinguishing between the fits of idiopathic epilepsy and those resulting from hystero-epilepsy, because the fact would be generally admitted that the inception of any treatment novel to the patient would be likely to modify the fits associated with the latter condition. Again, assuming that peripheral eye-irritation would cause idiopathic epilepsy, it would be better to correct the ametropia as fully as possible instead of partially correcting it, as Dr. Hern had done in his cases. Finally, he suggested that further investigation was needed before a definite conclusion could be come to on the connection between errors of refraction and epilepsy.

BRIGADE SURGEON LIEUTENANT-COLONEL E. F. DRAKE-BROCKMAN mentioned two cases of lunatics who had cataracts, and in whom the cataracts were removed by operation. The effects on the mental conditions of these two patients were of the opposite nature. One, who before the operation was a mischievously mad girl, became quite docile after sight was restored. The other, who before the operation was a quiet and inoffensive lunatic, became very violent and had to be placed under restraint. Dr. Drake-Brockman thought that these cases might throw a side light upon the effect pro-

duced on the mental condition of patients by the restoration of sight or by its correction by suitable lenses.

Dr. Percival had read the glowing accounts of some American ophthalmologists, who declared that they were able to cure many cases of epilepsy and insanity by correcting errors of refraction or by button-hole operations on the ocular muscles. A fair number of epileptic cases had been sent him, but he had no successes to report. No permanent diminution of fits seemed to have followed the most careful refractive correction. He would, therefore, think Dr. Hern's experience of three successful cases out of five most unusual.

Mr. W. J. Cant said that he had seen one case in which the correction of hypermetropic astigmatism + 2 + .75 at 150 both eyes (full correction) apparently cured the epilepsy. The fits were not frequent—on an average once a week—and not severe. Many other cases of epilepsy had been examined and all the ametropic cases corrected, but only in one other case was there any relief to the fits.

IRRIGATION OF THE ANTERIOR CHAMBER AFTER CATARACT EXTRACTION.

Haltenhof makes an abstract of Roethlisberger's thesis on this subject in the *Annales d'Oculistique*, September, 1893, as follows: After a complete study of the facts observed at Basel and in the papers published on this disputed subject, the author concludes in favor of irrigation as practised by Professor Schiess. The following are his conclusions: Irrigation of the anterior chamber aims only at the mechanical cleansing of the pupillary area and the reduction of the iris, but never has an antiseptic object. It is the quickest and gentlest process for extracting cortical remnants. The most suitable liquid is a lukewarm solution of concentrated boric acid, having the advantage over the physiological salt solution of remaining aseptic. Liquids which are not indifferent chemically—namely, solutions of chlorinated water, alcohol, sublimate, trichloride of iodine and distilled water—must be absolutely rejected, as they cause corneal troubles and iritic irritation.

ON THE ANTAGONISM OF ATROPINE AND MORPHINE.

Dr. Priestley Smith (*Ophthalmic Review*, July, 1893) abstracts an article by J. Samelsohn, reprinted from the *Centralbl. f. Klin. Medicin.*, 1893, No. 11, as follows:

The author points with surprise to the fact that medical writers are still debating the question whether morphine acts as an antagonist to atropine. His own experience of the value of morphine in cases of atropine-poisoning has completely answered this question long ago.

During the course of twenty-six years Samelsohn met with nine cases of severe atropine-poisoning, and this represented a proportion of about 1 in 10,000 patients. It is somewhat surprising, in view of the very frequent use—and, as the author holds, the very frequent abuse—of atropine in ophthalmic practice, that serious toxic symptoms should occur so seldom.

Six of the nine cases were in children, and were mostly due to unskilful use of the remedy, the drops finding their way into the mouth instead of into the eyes. The amount of the poison entering the system could not be estimated in these cases. The toxic symptoms were those ordinarily produced,—viz., extreme excitement of the vascular system, great restlessness often passing on to delirium, and in some instances general convulsions. In every case a morphine injection promptly brought the alarming symptoms to an end. The remarkable toleration of atropine by the dog was well illustrated in one of these cases. The drop-bottle being overturned, its contents were licked up by a dog and produced in him no noticeable disturbance, whereas the small quantity of the same solution previously used for the child had produced severe toxic symptoms. Since adopting the practice of prescribing atropine for children only in the form of an ointment, Samelsohn has seen no further case of poisoning, even in the mildest degree. He adds, however, that the case in which a woman gave her child an ointment—happily not an atropine ointment—to eat has warned him that even this method is not absolutely free from risk.

The other three cases were in adults.

Atropine drops prescribed for a child were taken in mistake by the mother, in place of another solution which she had received for internal use. Being summoned to the patient, Samelsohn found the usual vascular disturbance and feeling of intense anxiety. A subcutaneous injection of morphine, .02 gramme (nearly ⅓ grain), quickly relieved the symptoms.

The next case was one of some diagnostic uncertainty. Being hurriedly asked, in the absence of the usual medical attendant, to see a patient suddenly taken ill, the author found a young man, twenty years of age, violently delirious, struggling with some friends who with difficulty held him in bed, gesticulating to drive

away the phantom figures around him; the face intensely red, the eyes brilliant, the pulse 140, the respiration 34, the pupils widely dilated. The state of the pupils suggested atropine-poisoning, but no member of the household was known to be using atropine in any form. It appeared that the patient had drunk, fifteen minutes before the onset of the attack, a home-made infusion for the relief of boils. A subcutaneous injection of morphine, of the same amount as the previous case, quieted the patient in a few minutes, so that he could himself give an account of the occurrence. It then transpired that the infusion drunk by the patient had been ordered by a dentist for washing out the mouth, and that the chief ingredient was belladonna leaves. Half an hour after the morphine injection the symptoms of poisoning began to reappear and soon again reached an alarming height. A second injection again removed the delirium and lowered the pulse- and respiration-rate. The improvement lasted three hours, when a third injection, followed by five hours' sleep, permanently removed all symptoms, with the exception of paralysis of the pupils and accommodation, which gradually disappeared during the following five days.

The final case is of especial interest, because the poison was given subcutaneously, like the antidote, and the dose was known in each case. A woman, aged fifty, under treatment in hospital, was ordered pilocarpine injections, and had received several such without any disturbance. Hurriedly summoned to her from an adjacent ward one evening, Samelsohn found her sitting up supported by the nurses, gasping for breath, the hand pressed to the heart, the face flushed and intensely anxious in expression, the pulse too rapid to be counted, the pupils widely dilated and fixed. The suspicion that the injection which an assistant had given a few minutes before was of atropine instead of pilocarpine was confirmed by a glance at the bottle still standing on the table. An immediate subcutaneous injection of morphine relieved the urgent symptoms in five minutes, removing the feeling of anxiety, reducing the pulse-rate, enabling the patient to lie down, and lessening the intense dryness of the throat; an ice-bag to the heart and the moderate administration of wine completed the relief. No further injection of morphine was needed, and three days later even the dilatation of the pupils had disappeared. The quantity of atropine injected was not less than .008 gramme (about ⅛ grain), that of morphine was .02 gramme (nearly ⅓ grain).

These observations show that morphine is a therapeutic antagonist to atropine; it appears to hold the toxic nerve disturbance in abeyance while the system eliminates the poison.

EXCISION OF A PIECE OF THE MUSCLE IN SQUINT OPERATIONS.

W. G. T. Storey (*Ophthalmic Review*, July, 1893) abstracts an article by L. Müller, on excision of a piece of the muscle in squint operations, published in the *Monatsblätter für Augenheilkunde*, xxxi. p. 118, as follows:

The author believes that the operation to be described will be found an improvement on the ordinary operation of advancement. He prefaces his description of the operation with a very full account of the microscopic appearances in five pieces of antagonistic muscle removed by him (three from the rect. ext. and two from the rect. int.) compared with those of the normal muscle, specimens of which were procured from criminals. The chief points of difference were as follows in the antagonists: 1. The clear fibres (*hellen Fasern*) were to be found in relatively greater numbers. 2. In transverse sections the large number of nuclei in the muscle-cells and their central position in the cell was noticeable, and in longitudinal sections rows of nuclei were to be seen. 3. The finely-striated normal appearance of muscular tissue had largely disappeared, but fatty degeneration was not found, and the presence of connective-tissue degeneration was uncertain. Definite changes, therefore, were found, as was to be expected, in the antagonists, as these muscles are for a length of time overstretched.

Vieusse (*Recueil d' Ophthalmologie*, p. 330, 1875) first practised excision of a piece of the antagonistic muscle as a cure for squint, but he did this without combining with it tenotomy of the squinting muscle. Noyes also used the same procedure, both apparently in a few cases with good result, but the author's practice differs from theirs in the fact that he does not omit the tenotomy of the squinting muscle, but merely replaces the usual operation of advancement by one more consistent with surgical principles. He shows by quotations and by observations of his own that in the advancement operation the attachment of the muscle in its new position is difficult to secure, and may possibly, from its position being faulty, cause obliquity of the vertical axis of the eye. In his operation strict asepsis must be observed; the patient is put under an anæsthetic, to avoid the difficulties caused by spasm of the muscles. An incision is then made vertically about four mil-

limetres from the limbus conjunctivæ, and the muscle freely exposed and caught on the strabismus-hook; its side attachments to Tenon's capsule are then divided with a pair of scissors by lateral incisions reaching rather farther back than the length of muscle to be excised; the length to be cut out is then measured with a pair of compasses, allowance being made to leave a piece one or two millimetres in length attached to the sclera; two strong silk threads are then passed through the muscle just behind the spot found by measurement, one above and one below, so as to include about one-quarter of the muscle each, and are made fast with surgical knots; one end of each suture is then cut off, so that there is left knotted into the muscle one thread above and one below; in front of these the muscle is now divided, and is divided again farther forward, so as to leave a stump one or two millimetres in length attached to the sclera; through this stump another pair of sutures is passed in a similar way, leaving two free ends; the two upper and the two lower threads are now firmly knotted together, and, if necessary, an ordinary Wölfler's tendon suture can be placed between them; the conjunctival wound is then closed with two sutures. The sutures in the muscle are never removed (in one of the author's cases they slowly, after two months, ulcerated out), and cause no inconvenience. Both eyes are bandaged for three days, and the sound eye is then half covered with a piece of plaster in such a manner that the patient can only see on that side on which the muscle has been sutured; on the fifth or sixth day the sound eye is altogether uncovered, and on the eighth day the eye operated on is also uncovered and the conjunctival sutures removed. The author gives a table of seven cases of strabismus divergens and seven of strabismus convergens thus operated on by him. His results seem to show that in strabismus divergens up to six millimetres a piece of muscle corresponding in size to the deviation, and in strabismus divergens greater than six millimetres a piece one or two millimetres greater than the deviation must be removed to effect a cure, and in strabismus convergens a piece about one millimetre shorter than the deviation. He gives a complete table of his results. ' Of the seven cases of strabismus convergens, four were completely corrected and three partially (to within one or two millimetres); the amount of squint before operation in the different cases was from five to ten millimetres. In the seven cases of strabismus divergens, three were completely and four partially (one to two millimetres) corrected; the amount of squint before operation was from four millimetres to eight millimetres. The movements of the eye are not restricted after this operation as they are when the combined tenotomy is omitted, as by Vieusse and Noyes.

TENOTOMY.

PHELPS (*Boston Medical and Surgical Journal*, vol. cxxix. No. 28) after a discussion as to the comparative merits of tenotomy and replacement by force, and after a consideration of the value of manipulation and of braces in association with tenotomy, writes as follows concerning the operation:

Subcutaneous tenotomy should be performed upon all tissues which can be easily reached and divided with a knife without danger of cutting important blood-vessels or nerves. Nearly all of the tendons of the extremities can be subcutaneously cut with safety, and certainly one would never think of performing a large operation when a smaller one would do. When an open operation is performed, adhesions, sepsis, and wound infection are more likely to occur than in subcutaneous work.

There is, however, at the present time, but little danger from wound infection, and there is no objection to an open wound being made. It should be resorted to only where there is danger of cutting important blood-vessels, or for other reasons than to simply divide a tendon or nerves. The tendo Achillis should be divided subcutaneously.

Tendons passing through fibrous canals, as, for instance, those of the fingers, should not be operated upon in the fibrous sheaths, because adhesions usually follow.

The sterno-mastoid muscle should always be divided by an open incision along the clavicle. The iliacus internus and psoas muscles should always be divided at their attachment to the lesser trochanter by an open incision beginning at the greater trochanter and extending down the leg four inches. With a periostotome one can work over the femur, hugging it closely, and with safety detach the tendon from its attachment. The author did this once subcutaneously, and ligated the femoral about ten minutes after. The incision should be open to lengthen the biceps of the arm or split the tendon. Open incision should be performed when the hamstring tendons and surrounding tissues are shortened and require division.

The fasciculus given off from the tendon of the ring finger, when removed for the purpose of making the hand more useful for piano playing, requires an open wound. Open in-

cision, when performed on the sole of the foot for the relief of talipes varo-equinus, is not for the exclusive purpose of seeing just what is being cut, but to lengthen all the shortened tissues which hold the foot in the abnormal position.

Over-correction of any deformity should be practised. No tendons which are separated six inches can unite perfectly.

When open incision has been performed, after the required operation has been completed on the tendon, the wound should be closed and dressed antiseptically, and the parts should be kept at perfect rest for at least six weeks after the operation, after which, if deemed advisable, suitable braces can be applied.

By the introduction of strands of catgut, or tendons from the lower animals, reproduction of tendons may be made to occur.

THE RADICAL TREATMENT OF CYSTOCELE OR PROLAPSE OF THE BLADDER AND UTERUS.

CROWELL (*Medical Herald*, 1893) holds that cystocele usually follows parturition, and is due to faulty involution. There is, moreover, a condition of relaxation of the anterior wall of the vagina and of the floor of the pelvis permitting the descent of all relaxed superincumbent structures. The condition may be induced suddenly, but as a rule it is of slow development, so insidious in character that it becomes fully initiated before the patient is aware of it.

As a result of this prolapse, the bladder cannot expel its contents, hence there is residual urine, cystitis, pain, and tenesmus. For the relief of these conditions the slack in the anterior vaginal wall is gathered in, thus elevating the bladder to its normal position, and the uterus is anchored from above.

If a colporrhaphy is to be relied upon, it should consist in absolute separation and division of the vaginal septum from the bladder, removing such segments as are superfluous to the proper support of the prolapsed viscus. Such union should be stronger than those simply involving denudation, and better results might be anticipated; but, since the surfaces here involved are in an involuted, weak condition, any expectations of success from operations upon it alone must be doomed to disappointment in the majority of cases. To overcome the associated prolapse of the uterus the abdomen should be opened and the uterus sutured to the anterior abdominal walls at the lower angle of the wound. The technique now employed consists in passing three silkworm-gut sutures through the fascia of the abdomen and the fundus of the uterus from side to side. Once the sutures are in place, the fundus is scarified and lowered and apposition made. The sutures are cut short.

Ventro-fixation, if practised before the expiration of the child-bearing period, might prove an embarrassment to a perfect rising of the uterus into the abdominal cavity during gestation. If such cases should present, as they have in the author's practice, the fixation may be effected by attaching the round ligaments by a suture passing through the fascia as previously described, then picking up the round ligaments of each side, approximating each to the other and both to the under surface of the abdominal wall. In this procedure the fundus of the uterus is in no way restricted. This latter operation serves every purpose for retro-displacements, or procidentia if not aggravated, but it is not sufficiently rigid in its anchorage to serve for the correction of any considerable degree of cystocele or vaginal prolapse.

INGROWN TOE-NAIL AND ITS SURGICAL TREATMENT.

HOWARD (*International Journal of Surgery*) claims that removal of the entire nail gives only temporary relief, and the trouble returns, usually tenfold worse; for when the nail grows out again it is thick and deformed, and often the distal end of the matrix destroyed and the nail more sharply incurved than before. Cotting, some years ago, suggested removing all the inflamed part by cutting away the whole side of the toe, treating the resulting wound antiseptically. The contraction of the cicatrix resulting from this wound draws the soft parts away from the nail. In performing the operation the first incision is made about three-sixteenths of an inch from the edge of the ingrowing nail, the point of the knife being carried directly towards the bone, but not deep enough to wound the periosteum. An elliptical wedge-shaped section of skin and subcutaneous tissue is removed. A piece three-eighths of an inch in width is often sufficient. The wound is closed with deep silk sutures. On the fourth day the sutures are removed and the wound dressed as in other cases. In from a week to ten days a shoe may be worn with perfect comfort. The operation is rendered nearly bloodless by wrapping a small rubber band about the toe; this is allowed to remain on until the wound is closed.

SURGICAL INTERVENTION IN A SEVERE CASE OF PELVIC NEURALGIA.

RICHELOT (*American Journal of Obstetrics*) states that, in considering the utility of a radical operation for neuralgia, he refers to the most severe type of pain, situated in the uterus or appendages, corresponding to no discoverable lesion, and accompanied by a general neuropathic condition.

Laparotomy and vaginal hysterectomy are the two procedures to be considered. The former may be limited to a simple exploration, or include rupture of adhesions, partial resection of an ovary, unilateral castration, bilateral extirpation of ovaries and tubes. The latter may mean ablation of the uterus alone or of the appendages as well. Up to the present day laparotomy has been the only operation discussed. The author considers it far inferior to vaginal hysterectomy. He has himself performed the operation fifteen times in cases that had been partially cured by laparotomy, in five of which the neuralgia was the chief symptom. In all of them the result was good. Out of nine cases of hysterectomy not secondary to laparotomy, eight were successful. One of the patients no longer complains of pain, but has cardiac disease; two have been relieved of the pelvic pain, but complain of neuralgia elsewhere; five are perfectly well after a lapse of six, ten, and eleven months, and one after five years.

THE COLD DOUCHE AND TAXIS IN STRANGULATED HERNIA.

RAIFORD (*American Medico-Surgical Bulletin*) claims that ninety per cent. of the cases of strangulated hernia can be reduced within a few minutes by the method of treatment which he describes. The operator should be seated to the left of his patient, and should perform taxis while an assistant pours, from a height, cold water over the tumor. With the index and middle fingers he first finds the constriction, the exact localization of which is materially aided by traction made upon the uppermost part of the tumor with the right hand. This should be done simultaneously with the palpation of the stricture and with the first application of the cold douche. The constriction found, the fingers are gently inserted beneath it, where they are held with a slight pull upward, while the tumor is lifted upward and pressed inward with the right hand, the cold douche being continuously applied. The author has in his cases placed the patient in the dorsal position, shoulders lowered, hip elevated, thighs flexed at somewhat more than a right angle with the body.

Anæsthesia by inhalation or locally has never been found necessary, for reduction is accomplished in the time required to get the patient anæsthetized. In a few cases chloroform has been given, and a hypodermic injection of morphine or cocaine in two cases.

TRAUMATIC ATRESIA OF THE VAGINA, WITH HÆMATOKOLPOS AND HÆMATOMETRA.

KELLY (*Journal of Surgery, Gynæcology, and Obstetrics*) reports the case of a negress, about twenty-two years of age, who had been a constant sufferer since her first labor eight years previously, which was terminated by prolonged and severe instrumental interference. The child was still-born. Since that time she never menstruated, although suffering from monthly molimina, and with backache and discomfort in the lower abdomen. At one time she had an attack of pelvic peritonitis, during which she was confined to bed for several days. Upon attempting to make a vaginal examination, the finger passed into a large, smooth, capacious sac in which none of the ordinary landmarks were recognizable. Upon inspection to discover the source of error, it was found that the examining finger had entered the bladder without resistance through the urethra, which hung patulous under the pubic arch. Below this was a whitish spot composed of firm scar tissue about one centimetre in depth and one in breadth, representing the position of the vagina. Upon examining the pelvic organs bimanually by rectum and bladder, a series of large nodules were discovered in the posterior and upper part of the pelvis, which at first appeared to be myomata. A closer examination, however, showed these globules to be masses definitely arranged, one above the other, with shallow sulci between, and in the lower one fluctuation was distinctly felt. This was evidently due to distention of anatomical structures with preservation of their topographical relations. The upper portion of the vagina was distended with retained menstrual secretion; the cervical portion of the uterus had become converted into a sac, the internal os appearing as a constriction in the uterine body, while the upper portion of the uterus was likewise distended, thus forming the three masses, one above the other, in the following order: vagina, cervix, and uterine body.

No distention of the tubes could be distinguished. Repeated coitus through the

urethra had caused the enlargement of this channel. The patient was able to retain her urine about a half-hour.

With the index finger in the bladder and the thumb in the rectum, a large trocar was thrust between the thumb and finger, and evacuated five hundred cubic centimetres of thick, tarry blood. A dilator was introduced along the track made by the trocar, and the parts were widely torn asunder from one pubic ramus to the other. The canal thus made was four centimetres long. The edge of the vagina was now caught with forceps above the raw area and dissected free on all sides for about one centimetre, in the form of a collar, and, sliding down over the raw area, it was attached with six silkworm-gut sutures and a number of intermediate fine silk ones to the uninjured outlet. In this way the vaginal canal was restored without leaving any raw tissue. The result of the operation was a vagina of normal calibre and without apparent shortening.

THE SURGERY OF THE GALL-BLADDER.

BANKS (*Liverpool Medico-Chirurgical Journal*) has opened the gall-bladder on five occasions. The first two operations were performed upon elderly men, deeply jaundiced, and steadily becoming weaker and more emaciated. In each case a greatly-distended gall-bladder could be felt through the abdominal walls. This was stitched to the abdominal wall, and, when adhesion had taken place, opened. No stones were found in either case. The patients slowly sank from weakness, and after death it was found that there was cancerous disease present in both, involving the common bile duct. The third case was one exhibiting symptoms similar to those of the first two. He, too, had a greatly-distended gall-bladder. In this case the walls of the gall-bladder were so thin that, in attempting to introduce a needle through the peritoneal coat, bile oozed out through the needle hole. So it became necessary to slit up the bladder and allow the fluid to escape externally at once. Much of the jaundice disappeared, and the patient gained so rapidly in strength that he was soon able to get about again. A biliary fistula remained after the operation and refused to close. The man died some time later of cancer of the head of the pancreas.

The fourth case was that of a woman who had been jaundiced for some months.

At first there was only nausea, loss of appetite, and general malaise, but no pain. Some time later she had excessive pain in the region of the gall-bladder, but no enlargement could be made out. The pain was so great at times that the woman had convulsions.

The gall-bladder in this case was found tucked up behind the liver at a great depth from the surface. It was small in size and contained only a little bile. It was strongly bound down by adhesions to the duodenum and neighboring small intestines. There was considerable difficulty in breaking loose these adhesions. Every touch produced fresh bleeding. On examination of the bladder a stone was found at its orifice. This stone was removed. It was impossible to suture the gall-bladder to the abdominal wound. To some parts of the gall-bladder wound it was possible to pull down the parietal peritoneum, the rest was closed with omentum. The patient made a good recovery.

The fifth case was a jaundiced female suffering from pain in the region of the gall-bladder. A distinct increase in the size of the organ could be made out by palpation. At the operation it was found to contain a stone, which was removed.

Robinson performed cholecystotomy on twenty-five cases not exhibiting jaundice, without a death, and considers the operation practically devoid of serious risk. He operated on nine cases where there was jaundice but no malignant disease, without a death.

With regard to cholecystectomy, he is distinctly opposed to it, except under certain rare circumstances; for instance, after cholecystotomy the cystic duct may be occluded, but the hepatic and common bile duct may remain free. Then a fistula remains, from which mucus but no bile exudes; in such a case he would remove the gall-bladder.

Cholelithotrity he has practised on many occasions, chiefly for stones in the ducts; these he crushed with forceps protected with India-rubber, and pushed the fragments back into the gall-bladder. The calculi can be broken up with a needle previously. Sometimes, after crushing a stone in the ducts and pushing the fragments back into the bladder, he was content to leave the latter unopened.

He has collected seven cases of cholecysten-terostomy, with one death. He recommends attaching the gall-bladder, not to the duodenum, which is fixed, but to the ileum, a few inches lower. A loop of the ileum is taken up and stripped of its contents; a ring of India-rubber is tied around the neck of the loop. This keeps it empty of both blood and chyme. Incisions are made into the bladder and bowel and the two structures are sutured together with

a Czerny-Lembert suture. The patient on whom he operated made a good recovery, and was well three years afterwards.

CATHETERIZATION OF THE URETERS.

KELLY (*Annals of Gynæcology and Pediatrics*) describes an improved ureteral catheter, sound, and bougie, and refers to the methods of their use. Anæsthesia is unnecessary. The patient is placed in the lithotomy position, the bladder catheterized, and the urine set aside for comparison with that obtained from the ureters. The ureters are located by careful palpation through the anterior vaginal wall. The bladder is then distended with from five to seven ounces of aniline solution; this serves to do away with its rugosities, which would interfere with the catheterization. The catheter, closed at one end with a metal plug, is then introduced as far as the bladder, when its farther progress is assisted by sight and touch. The point is turned forward and the handle elevated, producing a slight prominence on the anterior vaginal wall, which forms a guide to the vesical orifice of the ureter. The end of the instrument is caused to glide in a fore-and-aft direction from the neck of the bladder to the cervix, in the median line, a little farther to one side, a little farther out, etc., until it reaches the ureteral eminence, which can be determined by the sense of touch. An attempt is then made to introduce the catheter into the ureter by carrying the handle to the opposite side, thus directing the point to the posterior wall of the pelvis; the instrument is then slightly withdrawn and turned a little more towards the side, and swept downward, outward, and backward in the direction of the ureteral prominence. The catheter is rotated with each of these motions until the point is directed fully outward and slightly upward.

When the catheter enters the ureter, touch will show that it holds a fixed position. It should be introduced into the ureter until its point reaches the wall of the pelvis, when the plug is removed from the end. A catheter may be introduced into the opposite ureter and both catheterized at one sitting. This is slightly more difficult. The urine from the catheter is caught in minim graduates. There should be a discharge of one-half cubic centimetre per minute from each catheter as a normal excretion.

The bladder being filled with aniline solution, the clear color of the fluid discharging from the catheters proves that it comes from the ureters. Fifteen minutes is an average time for the duration of the catheterization. The urine of each side should be marked and set aside for examination. The catheters should be plugged and withdrawn, and the urine in each of them added to that in the graduates of the corresponding side.

DILATATION OF CERVIX FOR DYSMENORRHŒA.

POND (*Annals of Gynæcology and Pediatrics*) considers three classes of dysmenorrhœa according to the etiology.

1. Where the cervix is small and elastic.
2. Where the cervix is long, conical, non-elastic, and cartilaginous.
3. Where there are associated flexures.

In the first variety he recommends the use of a light Palmer dilator, one or more times, without anæsthesia. It should be carried to the full expansion of the blades, and applications made to the canal, or a strip of iodoform gauze introduced. This can be carried out at the office.

For the second condition he recommends the free division of the stricture on two or more sides, from the internal to the external os, with thorough dilatation, and the introduction of a stem to be worn ten to fourteen days or longer, if necessary. Following this the cervix should be dilated once or twice a month to avoid subsequent contraction. Very long cervices require amputation.

In cases of flexion where, at times, it seems impossible to pass the light dilator, the Elliot repositor should be used, the organ carried into retroflexion, when the dilator can be easily passed beyond the angle of flexure. Should the cervix be dense, a heavier instrument may be used, and if this fail, incision and the stem are resorted to.

He reports seven cases illustrative of the application of the treatment in the different conditions, and suggests that dilatation be adapted to the relief of stenosis even in young girls.

CONTRACTION OF THE URETHRA IN WOMEN.

LOUBEAU (*Archives de Toxicologie et de Gynécologie*, 1893) refers to the rarity of this disease in the female. It is most frequently acquired, but may be congenital. When acquired, it is either of gonorrhœal or of traumatic origin. The gonorrhœal form is extremely rare. Cicatricial contractions may follow ulceration or traumatism. The symptoms are slow in appearing, owing to the dilatability of the canal.

The first symptom is a slight difficulty in micturition, which is followed by the sensation of a real obstacle, a lessened flow, pain in the back, groin, and pelvis. Cystitis may develop. Catheterization becomes painful or impossible. By vaginal touch the thickening of the urethra may sometimes be appreciated. The course of the affection is progressive. The diagnosis is established by the history and by an examination with a catheter. Inflammatory swelling of the urethral walls is to be excluded as well as spasm of the urethra.

A contraction of the canal may be produced by a polypus or tumor, but patient investigation will exclude them. Deviation of the urethra in cases of vesico-vaginal fistula may simulate obliteration. The treatment varies according to the case: cauterization, incision, electrolysis, dilatation, have all been resorted to. Loubeau reports a case of contraction due to cicatrization following cauterization for the removal of a polyp. The passage was almost entirely closed, but immersion in hot baths caused a flow of urine when all other methods had failed. Progressive dilatation was impossible, as no bougie or catheter could be introduced, hence internal urethrotomy was resorted to.

A narrow bistoury was introduced horizontally, following the normal direction of the urethra, and inserted to the depth of a little over an inch. The ensuing venous hemorrhage was copious, but easily controlled by compression. There was no post-operative incontinence of urine and not the slightest fever.

THE MANAGEMENT OF THE ABDOMINAL INCISION.

REED (*American Journal of Obstetrics*, September, 1893), in a paper read before the American Association of Obstetricians and Gynæcologists, held in Detroit, June, 1893, referred to the occurrence of suppuration during convalescence, and the subsequent development of ventral hernia. These complications he refers to defective methods in the management of the abdominal incision.

These relate, first, to the preparation of the patient; second, to the formation of the incision; third, to the method of closure; fourth, to the remote or after-treatment of the wound. Defective methods of preparation depend chiefly upon failure to recognize and remove the débris and germ elements from the minute interstices of the integument.

Defective methods in making the incision relate chiefly to failure to recognize the linea alba and to make the incision through it. Defective methods of closure relate chiefly to faulty principles in suturing. Defective methods of after-treatment relate chiefly to the application of the tight adhesive strap with pad, firmly compressing the incision. The methods recommended consist in a thorough cleansing of the abdomen by the application of, first, oil, next, ether with some strong alkali, cleansing with clear water, followed by the persistent application for over half an hour preceding the operation of a strong solution of bichloride of mercury. The incision should be made carefully in the median line and through the linea alba. The method of closure recommended is by interrupted suture of silkworm-gut, passed from within outward on both sides entirely through the tissues, but so passed that it enters the peritoneum near the margin of the wound, dips deeply into the median tissue, and is brought out through the integument near the wound margin. By this means all the structures are brought into immediate apposition when the sutures are tightened. They should not be tied tightly, and the knot should be on one or the other side of the incision.

The wound should be dressed with aristol or boracic acid, and a bandage carefully applied. When the sutures are removed a firmly-fitting adhesive strap should be applied, which does not exert such pressure as will induce compression of the incision with a subsequent tendency to separation of the internal margin. The advantages of the interrupted suture, as here suggested, consist, first, in the simplicity of application; second, in passing through and anchorage in the muscles; third, the apposition of like tissues to like tissues; fourth, painlessness after operation; fifth, minimum possibility of infection.

LAPARO-HYSTERECTOMY.

SENN (*American Journal of the Medical Sciences*, vol. cvi., No. 3), after a discussion of the indications and technique of laparo-hysterotomy, together with a report of two cases, submits the following conclusions:

1. Laparo-hysterectomy is justifiable when delivery through the normal passage is impossible without mutilation of the living child.

2. It is absolutely indicated where the conjugata vera is less than two and a half inches, when obstruction is due to fixed pelvic tumors and advanced malignant disease of the cervix.

3. Mutilating operations on a living child for the purpose of effecting delivery are no longer legitimate obstetric procedures, as laparo-hys-

terotomy and symphysiotomy are life-saving operations for both mother and child.

4. Hysterectomy after laparo-hysterotomy is only justifiable if the uterus itself is the seat of a life-threatening, removable disease.

5. Elastic constriction as a hæmostatic measure should not be resorted to in laparo-hysterotomy before the delivery of the child.

6. The uterine incision should be enlarged to the requisite extent by tearing for the purpose of diminishing hemorrhage.

7. The visceral wound should be closed by four rows of sutures applied in such a manner as to absolutely arrest the hemorrhage and completely separate the uterine from the peritoneal cavity.

8. Laparo-hysterotomy is also indicated in the operative treatment of single, large myofibroma of the uterus in young women when the tumor is located within or near the uterine cavity.

9. In such cases the uterine incision should be closed in the same manner as in operations on the pregnant uterus, and the bed of the tumor should be packed with iodoform gauze, which is brought through the cervix into the vagina, thus serving the double purpose of a hæmostatic tampon and capillary drain.

THE PRESENT STATUS OF THORACIC SURGERY.

GASTON (*Journal of the American Medical Association*, vol. xxi., No. 9), after discussing the various methods proposed, draws the following inferences:

1. All penetrating wounds of the thorax may be closed hermetically, by suture or otherwise, after allowing the discharge of fluid blood from the opening.

2. Foreign bodies lodged in the bronchi may be removed by incision of the trachea at the lowest available point.

3. Experiments on reaching the bronchi through the chest-wall afford little encouragement in undertaking operation upon the human subject.

4. Medication as a preventive and a curative agency in pleuritic effusion is worthy of trial before having recourse to aspiration.

5. Aspiration is indicated when there are large serous accumulations in the chest and likewise in pneumothorax, but cannot be relied upon for the relief of purulent collections.

6. Partial resections of ribs is attended with better results in some cases of empyema than the complete removal of the segments of several ribs.

7. The excision of a small portion of one rib with the introduction of drainage-tubes has been generally attended with good results.

8. Washing out the cavity of the chest is not requisite, except in contamination and decomposition of the contents.

9. The operation of thoracotomy for abscess and gangrene of the lung should be accompanied with antiseptic applications and with tamponage of gauze.

10. Tumors of the mediastinum may admit of interference, but further development of technique is necessary before the method can be generally advised.

ON A SIMPLE METHOD OF TREATING THE WOUND AFTER EXCISING HEMORRHOIDS.

JONES (*Provincial Medical Journal*, vol. xii., No. 140) recommends the following method of treating the wound after excision of hemorrhoids:

The hemorrhoid is placed within the clamp (Smith's by preference) and cut off, leaving about an eighth of an inch of pedicle. This cut edge is sewed with a catgut suture, the clamp removed, and the operation is complete. The best plan is to take a piece of catgut about eighteen inches long, with a needle at each end. One needle is passed through the upper end of the pedicle and a first knot is tied; then the needles are passed from left to right and right to left, and each time they cross the pedicle are tied. Except in the case of friable granular hemorrhoids, the cautery should not be used, as burning the pedicle of necessity means the subsequent separation of a slough.

DRAINAGE OF THE BLADDER BY MEANS OF AN OBLIQUE FISTULA AFTER SUPRAPUBIC CYSTOTOMY.

MARTIN (*Centralblatt für Chirurgie*, No. 47, 1893) advocates the method of oblique canalization, applied by Witzel, in the operation of gastrostomy, to drainage of the bladder after suprapubic section, and refers to one case contributed by Zweifel, in which a similar operation was performed after opening the peritoneal cavity for the extirpation of a carcinoma growing at the vesical orifice of the urethra. Martin operated on a man aged sixty-seven, suffering from retention of urine due to enlarged prostate. For seven years the patient had been compelled to use a catheter five times a day. Finally, he was not able to introduce the instrument, nor was the physician to whom

he applied any more successful. The bladder was distended so that it reached as far as the umbilicus. The prostate was markedly enlarged. It was found impossible to introduce an instrument by way of the urethra. The patient was put in the Trendelenberg position, and a three-inch incision was made, running down to the symphysis; the bladder was freely exposed; the peritoneal fold was found two inches above the symphysis and was easily pushed still farther upward by blunt dissection. The wound margins were drawn widely apart by means of retractors, and the whole anterior bladder-wall was exposed, so that the following manipulation was easily carried out: A trocar was thrust through the bladder-wall low down behind the symphysis, and a portion of black, blood-stained, offensive urine was withdrawn. The bladder-wall was fixed on each side of the canula by means of clamps; the opening through it was slightly enlarged by means of a bistoury, so that a Nélaton catheter of medium size could be passed through. This was secured to the bladder by means of a catgut suture, and then, by means of a series of sutures running at right angles to the long axis of the catheter, passing in and out of the bladder-wall to one side over the catheter and in and out on the opposite side, a canal was formed at the expense of the bladder-wall. This canal was two inches in length. The sutures were silk, and after they were tied they were reenforced by a continuous suture.

The wound was packed with iodoform gauze; the end of the catheter was brought out through its upper angle and was secured by means of an adhesive plaster. The healing of the wound was rapid, in spite of a severe venous hemorrhage, which recurred three times in twenty-four hours, but was stopped by means of ice and ergotine. This bleeding apparently came from wounds caused by violent attempts at catheterization. After three days the temperature was normal and the urine became clear and healthy in appearance. The urine escaped by means of a drainage-tube attached to the catheter. This instrument was changed on the twelfth day. On the introduction of a new instrument a very distinct elastic resistance was encountered. This was overcome by gentle pressure, and, the instrument entering, some urine flowed out. This resistance was evidently due to the reflex muscular contracture excited by instrumentation. After the fourth day the dressing was entirely dry. The fifteenth day after operation the patient was allowed to get out of bed. The end of a Nélaton catheter was fastened by means of a clamp and no urine flowed by the side of the instrument. The capacity of the bladder rapidly increased, so that in a short time a pint could readily be retained without a drop escaping by the side of the catheter. The patient was perfectly comfortable, and four times a day released the clamp at the end of the catheter and evacuated the contents of his bladder.

RHYTHMICAL TRACTION OF THE TONGUE AS A MEANS OF RESUSCITATING THE ASPHYXIATED.

LABORDE (*La Tribune Médicale*, No. 46, 1893), who first called attention to the value of rhythmical traction of the tongue as a means of stimulating respiration, has collected much evidence in regard to the value of this method as applied to cases of threatened death from asphyxia. Among the cases contributed, that of Denuce is very interesting. The surgeon was performing a tracheotomy on a patient suffering from neoplasm of the larynx. Chloroform was being given; this had been preceded by an injection of morphine. Respiration was entirely suspended; the patient became blue and, indeed, almost black from asphyxia. Although a canula was placed in the trachea, there was no effort at breathing. Rhythmical traction of the tongue was at once made, and finally respiration was restored.

Massé states that this method is an excellent adjunct to the other well-known resources in case of accident during anæsthesia. By this means he has been able to restore dogs apparently dead from the administration of chloroform. Sometimes respirations were not renewed until after ten minutes.

Ménière, while operating for caries of the mastoid process, the patient being under the influence of chloroform, perceived that breathing had stopped, and on examination could not detect any motion of the heart. The face was cadaveric in appearance. The child was turned head down, artificial respiration was started at once, and the tongue was seized in a pair of forceps and rhythmical tractions were made upon it. The first respiration was not noted for six minutes. The child recovered.

Laborde holds that in chloroform anæsthesia, when death is threatened from respiratory or cardiac syncope, or the two combined, the tongue method is the most powerful and rapid means of resuscitation, aiding not only the freeing of the throat, but actually stimulating respiration. He contributes a case of apparent death from violent shock of an electric current. The strength of the latter was more than two

thousand volts. The hand of the patient was burned and the body was black. The tongue was seized with a pair of forceps and rhythmical traction was made upon it for more than an hour, at the end of which time natural respirations were resumed and the patient recovered.

THE TREATMENT OF ACTINOMYCOSIS BY IODIDE OF POTASSIUM.

NETTER (*La Tribune Médicale*, No. 46, 1893) presents a patient cured of actinomycosis by medical treatment. This patient was a woman, always healthy until last August, when she suffered from a left sero-fibrinous pleurisy. There was slight amelioration of symptoms under salicylate of sodium treatment. This was followed by an aggravation of symptoms without apparent reason. For some time there was found beneath the left breast a patch of hard œdema about as large as the palm of the hand. In the middle of this patch there appeared a nodule as large as a walnut. This was located over the anterior extremity of the twelfth rib. This nodule softened, and on incision there was evacuated a small quantity of pus. The rib was not denuded, but the opening did not close, and there was a long fistulous tract. Since the general condition became more serious, and inoculation of the pleuritic fluid on a guinea-pig gave negative results, actinomycosis was suggested, and a daily systematic examination of the discharge was instituted. This resulted in finding the characteristic filaments. These were not found in the expectoration, from which fact the author concluded that the disease was probably located in the posterior mediastinum, the pus having made its way along the ribs and having caused by inflammation of the contiguous structure the sero-fibrinous pleurisy. Iodide of potassium was administered. This was followed by prompt recovery. The author reports two other cases of pleurisy excited by actinomycosis. He states that this disease is rare in France. He states, further, that one hundred and eighty-five oxen suffering from this disease were treated in Chicago with iodide of potassium, and that seventy-one of them were cured. It is probable that the iodide does not act as a specific, since it has been shown that the organism will grow upon gelatin containing one per cent. of the drug. It perhaps acts by augmenting tissue resistance.

Six successful cases are reported from Holland. The drug must be given in full doses,—80 grains a day at first; diminished as the physiological effect is produced.

THE NON-OPERATIVE TREATMENT OF SALPINGO-OVARITIS.

SHOEMAKER (*Journal of Surgery, Gynæcology, and Obstetrics*, August, 1893) refers to the value of the conservative treatment of inflammatory conditions of the tubes and ovaries. He believes that removal of the appendages should not be advised until other treatment known to be carefully applied has failed. As a guide to prognosis without operation, he mentions the amount of organized adhesions and to some extent the amount of prolapse of the ovaries. Should the appendages be badly adherent and prolapsed, relapses are frequent, and no definite progress towards a real cure can be made, though all soreness be removed by treatment and the patient's condition remain satisfactory. He counsels the removal of diseased organs, where there is no reason to expect pus, in a small proportion of the cases of salpingo-ovaritis. These are cases where adhesions are insurmountable, and there seems to be valid ground for considering the lesion present to be the starting-point of a stubborn relapse. A careful use of iodine, ichthyol, boro-glyceride tampons, and elastic wool packing is indicated before the decision is made. The operation will be decided upon much earlier in a poor patient than in a woman of leisure. Where the lesions are not so gross as to make the decision for operation imperative, there must be weighed against removal the risk to life, the possible destruction of the sexual desire, the liability to hernia, the persistence of adhesions of the bowel, bladder, or omentum to the stump or cicatrix, the flushings and paræsthesia which book themselves about the monthly molimen, even though there be no flow.

Palliative treatment has failed not only in those cases where the anatomical lesions are not considered great enough to call for operation, but also in a few instances of serious type where the patient or her family refuse operation. While the idea of permanent and absolute cure must be dismissed, the patient can be made comfortable. The treatment usually lasts several months, sometimes for two or three years.

ICHTHYOL IN ERYSIPELAS.

THOMAS (*Liverpool Medico-Chirurgical Journal*, July, 1893) refers to the treatment of erysipelas by ichthyol, and mentions four cases so treated, three of which were complicated by large surgical wounds. The onset of the disease was sudden and the temperature high. As a result of the treatment the disease was cured

on the fifth day. In only one case was there sleeplessness. None required stimulants, and all experienced great relief from pain after each application of the remedy. Success in this treatment depends upon a very thorough rubbing of a strong ointment of ichthyol with vaseline or lanoline into the red area and into the adjoining healthy skin, covering the parts with a sheet of lint or the ordinary surgical dressing.

ABDOMINAL SECTION WITH ENTERORRHAPHY FOR GUNSHOT WOUNDS OF THE INTESTINES.

BRADY (*International Journal of Surgery*, August, 1893) reports twenty-eight cases of gunshot wounds of the intestines operated upon by abdominal section at the Charity Hospital, New Orleans, with a total of nine recoveries. This does not include those cases of abdominal section in which the liver, spleen, or bladder alone was injured. No stress has been laid upon the existence of peritonitis, either plastic or purulent, previous to the operation, though this existed in about one-third of the cases operated upon, owing to the long time which had elapsed between the receipt of the injury and the operation. Of three wounds of the stomach, all died. Of three wounds of the colon, all recovered. Of thirteen wounds of the small intestines, six recovered. He believes that cleansing of the abdominal cavity is of the utmost importance and should be carried out with every care. This can be done by introducing a constant stream of sterilized water at a temperature of from 110° to 115° F. to the bottom of the cavity by means of a rubber tube of large calibre attached to a funnel. He objects to the use of absorbent cotton for sponging, as frequently this material has been detected in a post-mortem examination where cotton has been used during the operation. For suturing the bowel he uses silk.

As regards the nourishment after the operation, he thinks small quantities of liquid food administered at frequent intervals by rectum or mouth, according to the relative situation of the wound, would place the patient in better condition than where food is withheld for the first twenty-four hours. A wound of the stomach does not seem to preclude the administration of two ounces or more of predigested milk, together with half an ounce of brandy by the rectum, within twenty-four hours after the injury. Should a like wound of the colon be present, he gives the same food by the mouth, at equal intervals. These patients usually die of peritonitis or exhaustion. The treatment of this is largely directed to maintaining strength until the violence of the attack has abated, so that by excessive caution in the administration of food the patient is handicapped in his fight for life.

ISCHIO-PUBIOTOMY.

HENDERSON (*Lancet*, August, 1893) reports the following case from notes of Pinard and Farabeuf. The patient, a thirty-two-year-old fivepara, was delivered at term of a living child by ischio-pubiotomy. She was delivered of her first child by version and basiotripsy upon the after-coming head. In her second labor she was attended by Pinard, who induced premature labor. The child was delivered by version, difficulty being met with in extracting the head. The child died in its fifth month. Her third child was delivered at term. After six ineffectual attempts with the forceps, version and an attempt at craniotomy, the seventh application of the forceps to the after-coming head, and finally traction upon the trunk, assisted by pressure upon the abdomen, her fourth child was delivered prematurely by forceps, child dying from prolapse of the cord. During her fifth pregnancy she consulted Pinard, and expressed the desire to give birth to a living child at all costs. It was first supposed that the child could be delivered by symphysotomy. Repeated examinations, however, convinced him that there was anchylosis of the right sacro-iliac synchondrosis, and the operation of symphysotomy was therefore inapplicable.

Pinard then consulted with Farabeuf, who calculated that if the margins of the obturator foramen of the anchylosed side were cut in two places as far from the mid-line as possible, the passage of a large head would be easy. The woman was, therefore, allowed to go to term. The operation was begun fourteen hours after the advent of labor. The ischio-pubic ramus and the horizontal ramus of the pubes on the anchylosed side were successively sawed through five centimetres from the median line. Tarnier's forceps was applied above the brim, and an infant weighing almost eight pounds was extracted without difficulty. The operation was simple, the only difficulty experienced being in passing the chain-saw around the horizontal ramus of the pubes. Hemorrhage was slight. The spontaneous separation after section of both rami amounted to two and six-tenths centimetres, and was increased four centimetres during the extraction. The soft parts alone were sutured. A bed-sore in the sacral

region was the only complication. Sutures were removed on the eighth day. Three days later the patient sat up, and on the thirty-second day she was able to walk and stand without difficulty.

TREATMENT OF SKIN CANCER.

In the discussion over Lassar's contribution upon this subject, read before the Berlin Medical Society (*Monatshefte für Praktische Dermatologie*, Bd. xvii., No. 10), KÖBNER held that the cases presented by Lassar were not conclusive, since Langenbeck had presented a similar favorable result from arsenic treatment, the patient, however, perishing a year later from récidivity. In Lassar's second case the diagnosis is not assured; in the third case the patient is not fully healed. Köbner holds that arsenic and all other remedies administered by the mouth are utterly without power, and that cure is never accomplished, excepting when the ulcer is completely removed by means of a knife in the early part of its course. Only when patients present themselves too late for operation should resort be had to medical treatment.

Bergmann gave the history of three cases in which ten, seven, and five years respectively had passed without recurrence. In considering the radical cure of skin cancer it must be remembered that cicatrization is followed by destruction of cancer cells. Such cicatrization may take place quite independently of any therapeutic treatment. Under some circumstances carcinoma will last twenty years and then undergo cicatrization. Small clusters of cells may remain latent for years. Following seborrhœa, ulcers develop which closely resemble carcinoma. Before a physician recommends internal treatment he should remember that these skin cancers frequently do not recur when thoroughly removed by the knife. Lassar, in answer to these criticisms, stated that he exhibited his patients simply to show that by arsenic treatment carcinomatous nodules in the face were prevented from running their customary course.

BLOODLESS AMPUTATION AT THE HIP-JOINT.

WYETH (*Medical News*, vol. lxiii., No. 24) describes at length his method of performing bloodless amputation of the hip-joint.

With the patient in the usual position for a hip-joint amputation, the limb should be emptied of blood, either by elevation of the foot and lowering of the trunk, or by the Esmarch bandage applied from the toes to the trunk. Under certain conditions the bandage can be only partially or may be not at all applied. When a tumor exists, or when septic infiltration is present, pressure should only be exercised not quite to the diseased portion for fear of driving septic matter into the vessels. After injuries attended with great destruction, crushing, or pulpification, of course the Esmarch bandage is not applicable, and one must trust to elevation to save as much blood as possible.

While the member is elevated, or before the Esmarch bandage is removed, the rubber-tubing constriction is applied.

The object of this constriction—and this is the chief point in the method—is the absolute occlusion of every vessel at the level of the hip-joint safely above the field of operation.

To prevent any possibility of the tourniquet slipping, Wyeth employs two large mattress-needles or skewers, about three-sixteenths of an inch in diameter and ten inches long, one of which is introduced one inch below the anterior superior spine of the ilium and slightly to the inner side of this prominence, and is made to traverse superficially the muscles and fascia on the outer side of the hip, emerging on a level with and about three inches from the point of entrance.

The point of the second needle is made to enter one inch below the level of the crotch, internal to the saphenous opening, and, passing squarely through the adductors, comes out an inch below the tuber ischii. The points are at once shielded by bits of cork to prevent injury to the hands of the operator. No vessels are endangered by these skewers. A piece of strong white-rubber tube, half an inch in diameter and long enough when tightened in position to go five or six times around the thigh, is now wound very tightly around and above the fixation-needles and tied. If the Esmarch bandage has been employed, it is now removed.

In the formation of flaps the surgeon must be guided by the condition of the parts within the field of operation. When permissible, the following method seems ideal: About six inches below the tourniquet a circular incision is made, and this is joined by a longitudinal incision, commencing at the tourniquet and passing over the trochanter major. A cuff that includes the subcutaneous tissues down to the deep fascia is dissected off to near the level of the trochanter minor. At about the level of the trochanter minor the remaining soft parts,

together with the vessels, are divided down to the bone by a circular cut, and, in order to facilitate the search for the vessels, the soft parts are rapidly removed from the femur for several inches below the line of the divided muscles. At this stage of the operation the larger vessels, veins as well as arteries, should be tied with good-sized catgut. As suggested by Professor Murdoch, of Pittsburg, Wyeth leaves the entire extremity intact and uses the full length of the limb as a lever in dislodging the head of the bone.

When the larger and easily-recognized vessels have been secured, the muscular attachments to the upper extremity of the bone are lifted off with scissors or knife, keeping along very close to the bone. Holding the soft parts away with retractors, the capsular ligament is exposed and divided in its circumference. Forcible elevation, abduction, and adduction of the thigh permit the entrance of air into the socket and at the same time rupture the ligamentum teres, and the disarticulation is thus easily and rapidly effected.

Properly conducted up to this point, not a drop of blood has escaped, except that which was in the limb below the constrictor when this was applied. If now the tourniquet be carefully and gradually loosened, each bleeding-point may be determined and the forceps applied as required until the tube is entirely removed.

Should any difficulty be encountered in the effort at enucleation (which is scarcely possible), the same precaution in securing all bleeding-points should be exercised in removing the tourniquet, and enucleation completed with the tourniquet out of the way.

There remains the closure of the wound, with the usual precaution of drainage. Wyeth prefers silkworm-gut for suture material, and one good-sized rubber drain from the acetabulum out through the most dependent part of the wound.

TREATMENT OF ALOPECIA.

FERRAS (*Annales de Dermatologie et de Syphiligraphie*, tome iv., No. 10) holds that alopecia should be treated not only by local applications, but by remedies which influence the entire system. He commends baths, thirty to forty minutes' duration, of strong sulphur-water. These are followed by massage for ten or twenty minutes and hot spray lasting for from three to five minutes. A half-pint of sulphur-water is taken morning and evening. Locally, he commends the use of tincture of iodine and hot sulphur-water sprays.

SUCCESSFUL TREATMENT OF SEPTIC THROMBOSIS OF THE LATERAL SINUS.

VICKERY (*British Medical Journal*, No. 1717, 1893) reports a successful operation for the relief of septic thrombosis of the lateral sinus, calling attention to Lane's seven successes out of eight operations.

The patient was a boy of eight years, who had always been healthy, with the exception of slight bilious attacks. About two years ago he had an attack of measles. He had suffered from intermittent purulent discharges from the right ear. In June, 1893, the discharge stopped, and was followed by severe earache, slight rise of temperature, puffiness over the parotid region in front of the tragus and behind the angle of the jaw, and tenderness on palpation in the same region. This was not noted over the mastoid. In a few days there was some subsidence of local symptoms, but this was shortly followed by distinct rigor, pain in the neck, and stiffness. The rigor was repeated; the temperature ran up to 104.6° F., pulse to 120. The neck was rigid, distinctly swollen, and on palpation tender; enlarged glands were felt, extending from below the pinna down to the middle of the neck, along the carotid sheath. Vomiting, rigors, fever, and the other symptoms continued for several days. Operation was performed June 19. A three-inch incision was carried along the anterior border of the sternomastoid, the centre of the incision being at the level of the cricoid and exposing the internal jugular vein, shelling out some inflamed glands on the way. No thrombosis was found, but the blood-stream was apparently very sluggish. A ligature was placed round the vessel at the lower end of the wound, when the vein immediately collapsed. This clearly pointed to blocking of the circulation on the cerebral side. A semicircular flap was dissected down and a trephine applied, the centre of the instrument being over the posterior inferior angle of the parietal bone. The sinus was seen to contain fluid, but as it had a yellowish appearance, as if it might contain pus, a free incision was made into it. If there was any pus, it came with the first rush of blood. The free hemorrhage was immediately stopped by a pad of iodoform gauze, and then uniting the flap over the pad, tying the first half of the ordinary surgeon's knot and leaving the end long. The neck wound was sutured and dressed. Pulse and temperature dropped promptly. His pain was relieved, but on the following evening there was a rigor, accompanied by vomiting,

purging, a rise in temperature and pulse-rate. Temperature dropped during the night, pulse keeping rapid. The following day there was noted a tender swelling on the palmar surface of the first phalanx of the middle finger, extending on to the palm. No fluctuation was then apparent. On the afternoon of that day there was another severe rigor, accompanied by purging and vomiting. On the evening of the same day his temperature was normal, his pulse stronger. Ultimately the palmar abscess was incised. This was followed by one or two rigors. The patient finally made a good recovery.

Vickery states that the explanation of the case seems to be that there was a septic thrombosis of the lateral sinus sufficiently advanced to have reached the general circulation before operation, and to have occasioned the palmar abscess and the rigor subsequent to the first operation.

In relation to this case, Marsh reported a similar one in which opening of the mastoid antrum and evacuation of fetid pus had not been followed by improvement. To prevent further purulent absorption the internal jugular was exposed and ligated. The operation was not followed by bleeding, showing that the lateral sinus was blocked. This vessel was cleared out as far as possible; but at the time of the report the child's condition was not materially improved.

TREATMENT OF PRURITUS.

In the discussion of a paper on this subject by BRONSON a number of interesting points are brought out. Bronson held (*Journal of Cutaneous and Genito-Urinary Diseases*, vol. xi., No. 135) that the underlying condition of pruritus is hyperæsthesia, hence the prime indications in the treatment are to allay or annul excess of nervous excitement. Measures to remove local excitants include such as directly tend to prevent scratching. To admonish the patient to restrain from this is usually of little avail. Restraint may be possible during waking hours, but at night, when the trouble is always at its worst, and especially during the state of somnolence midway between sleeping and waking, no power can prevent it. It can only be avoided by first mitigating the lesion through the aid of antipruritics. Sedatives, when used internally, are apt to be disappointing, and indeed after their use general hyperæsthesia is usually exaggerated. Narcotics are especially objectionable. Bromides are often indispensable and may be required in full doses. To avoid the weakening effects of insomnia, sulphonal or some other hypnotic is occasionally needed. In addition, two internal remedies are worthy of mention; these are cannabis indica and gelsemium. Carbolic acid, characterized by Unna as the opium of the skin, is the most useful antipruritic agent possessed by the dermatologist. The following antipruritic oil is warmly commended, and it is stated that it never causes any results more serious than a trifling dermatitis:

℞ Carbolic acid, ʒi;
Liquor potass., ʒi;
Ol. lini., ʒi.
Sig.—Shake before using.

A drop or two of the oil of bergamot will cover the linseed oil. Salicylic acid and salol act much as does carbolic acid. Thymol is often valuable, but also is irritating to sensitive skins.

Pruritus hyemalis is prevented by guarding against cold, since the sole cause of this distressing affection is lowered temperature.

Hyde, in commenting upon these conclusions of Bronson, stated that he has long since dropped cocaine, since it is extremely liable to develop the habit. He alluded to two methods of treatment, both of value. The first consists in exclusion of air. Thus some of the successful pastes depend for their beneficial effect upon this action. Another method of relieving pruritus, when it is circumscribed and strictly limited to one side of the body, is in treating the other and corresponding side with substitutive stimulants. A case is narrated in which a patient had long suffered from an almost intolerable pruritus of one leg. Relief was obtained only after stimulating the other corresponding side of the body. Hyde called attention to gout as a frequent cause of pruritus. Next in importance he names diabetes.

Corlett states that in prurigo hyemalis the internal administration of ichthyol has apparently given him excellent results. He applies lanolin to the skin locally after the surfaces have been bathed. Resorcin has given better results than any other drug. This is used in the strength of three to five per cent., and is applied in aqueous solution.

Morrow condemns the use of gelsemium, and states that he has had excellent results from the employment of the hot-water bag applied to the spine. Indeed, he lauds this treatment above all others in certain obstinate cases occurring in people. Among the local remedies he has had the best results from a combination of car-

bolic acid and camphor. He uses this in the strength of one and two drachms of each drug to the ounce of zinc ointment. Another excellent remedy is salicylic acid made up in the form of wax and spermaceti, in the form of an ice, or in rose-water in the form of a solution.

Hardaway states that, in addition to the remedies already mentioned, there are three drugs which he gives with sometimes successful results. These are quinine in 10- or 15-grain doses at night, wine of antimony given in divided doses during the day, and pilocarpine by the mouth or hypodermically, especially where the skin is harsh and dry. He holds that carbolic acid as a local application stands at the head of the antipruritics, but prefers to have it sprayed on by means of an atomizer.

Denslow calls attention to the value of ergot.

Reviews.

A Manual of Practical Hygiene designed for Sanitary and Health Officers, Practitioners, and Students of Medicine. By W. M. L. Coplin, M.D., and D. Bevan, M.D. Illustrated.
Philadelphia: P. Blakiston, Son & Co., 1893.

The average book upon hygiene is either devoted to trivialities and designed for common-school purposes, or, like Parke's celebrated manual, is so thorough and exhaustive as to be exhausting as well to any one who desires to obtain scientific information without reading a large amount of statistics and studying many pages of text. The authors of this book of four hundred and fifty pages have endeavored to fill the space lying between these two forms of hygienic literature, so to speak, and we think they have succeeded. Many of the illustrations are original, being drawn by Dr. Bevan, and the authors have taken much pains to include in the work new facts concerning climate and cognate subjects. Their positions at present and in the past, in connection with the government service and as pathologists or bacteriologists to large hospitals, have given them ample opportunities to study the needs of the class of persons for whom the book is destined, and the large experience they have had in teaching institutions has taught them in turn how to state facts in such a way that the scholar may readily grasp them. We feel confident that this book will be appreciated by those for whom it is written, and that it will be a constant source of credit to its indefatigable and careful authors.

Manual of Physical Diagnosis for the Use of Students and Physicians. By James Tyson, M.D. Second edition, revised and enlarged.
Philadelphia: P. Blakiston, Son & Co., 1893.

If Dr. Tyson has one *forte* above another it is his ability to use his pen in such a way as to make descriptions of medical facts clear and interesting to the student or physician. His articles are perhaps more widely quoted than those of almost any other writer in the medical journals of the day, and the various brochures which he has published from time to time have been read by the profession with avidity. The second edition of his little work on "Physical Diagnosis" bids fair to be even more successful than his other contributions to medical literature. The ideas are clearly expressed, and a certain number of clear diagrams accompany the text to make the descriptions readily understood. The smallness of the work, its completeness, and its comparatively low cost, added to the advantages which we have already named, will be strong aids in causing its still further employment during student days.

Burdett's Hospital Annual and Year-Book of Philanthropy. 1893.
London: The Scientific Press, Limited.

To those who are interested in the subject of hospital management this book will bring a large amount of exceedingly valuable information. In addition to its text, which is very carefully prepared, a number of tables are given, showing the cost of maintaining various kinds of hospitals all over the world and the names of nearly all the prominent hospitals in the world, especially in the English provinces and in America, with information concerning their staffs, income, cost of maintenance, and methods of nursing. While it deals naturally to a great extent with English institutions, far more credit has been given to and pains taken in regard to American hospitals than is ordinary in such international publications.

The Physician's Visiting-List for 1894.
Philadelphia: P. Blakiston, Son & Co., 1893.

Forty-three years of experience in preparing a list for the physician has enabled the publishers of this well-known pocket-book to arrange a large amount of condensed information without making their book difficult of being carried in the pocket. It is especially to be commended for the pliability of its cover, the lightness of the paper which it contains, and the conveniences offered for entering a record of patients.

THE MEDICAL NEWS VISITING-LIST, 1894. THIRTY PATIENTS PER WEEK.
Philadelphia: Lea Brothers & Co., 1893.

This "Visiting-List," which we have found to be very useful, contains, in addition to its well-arranged blank pages, information, in a brief form, in regard to the period of dentition, estimating the day of confinement, the thermometric scales, weights, and measures, including the metric system, two or three pages upon the examination of the urine, a page on artificial respiration, a table of the eruptive fevers, a list of poisons and their antidotes, and, finally, a table of doses arranged in two columns, which give the amounts in Troy weight and the metric system. One of the most useful parts of the List to the physician who is called to an emergency is the brief space given to the ligation of arteries, accompanied by a diagram showing where the incision should be made for the ligation of blood-vessels. Notwithstanding the large amount of material contained between the covers of this book, it is much less bulky than would be supposed and can be readily carried in the pocket.

A MANUAL OF DISEASES OF THE EAR. By G. P. Field, M.R.C.S., Aural Surgeon to St. Mary's Hospital, London. Fourth edition. Three hundred and seventy-one pages. Illustrated with colored plates and wood-cuts.
Philadelphia: Lea Brothers & Co., 1893.

The new edition of this excellent manual of the ear and its diseases covers the field of otology in nineteen concise and practical chapters. We desire to call attention to the enormous amount of excellent material that this little volume contains and the instructive and comprehensive manner in which the subject is handled. The author's views are so plainly and forcibly expressed that the student and general practitioner of medicine cannot afford to be without their teaching and careful guidance if he would do the justice to his patient that the present advanced state of otology legally demands.

Some forty pages are devoted to a careful review of the minute anatomy and physiology of the ear. The subject of chronic suppurative inflammation and its results is ably discussed in four chapters, which comprise the most important part of the work. In these chapters will be found sound and trustworthy advice on aural polypi, facial paralysis, caries and necrosis, mastoid and brain abscess, phlebitis and pyæmic thrombosis of the lateral sinus, as well as visceral sequelæ, the result of chronic aural discharge. We are pleased to find the author so strong an advocate of properly-conducted irrigation in suppurative diseases of the ear, as this is undoubtedly the only means by which we can obtain thorough asepsis in a large proportion of our cases.

A wholesome conservatism is a marked feature throughout the book, and yet it is gratifying to find that in selected cases the author strongly advocates the intratympanic surgical methods that have met with such marked success in the hands of many aurists in this country. This observation applies particularly to the treatment of that large class of otherwise incurable cases which are discussed under the head of "Chronic Suppurative Inflammation with Caries and Necrosis." To quote the exact views of the author, "After sequestra, granulomata, and cholesteatomatous masses have been removed, all carious areas must be cautiously but thoroughly *curetted*."

The brief space allotted for this review will not permit of extended comment; suffice it to say, however, that within the covers of this book will be found information sufficient to supply the needs of the student and practitioner of general medicine in all practical matters pertaining to diseases of the ear.

S. MACC. S.

MENTAL NURSING: A TEXT-BOOK FOR ASYLUM ATTENDANTS AND NURSES. By William Harding, M.D.
London: The Scientific Press, Limited, 1893.

This small volume consists of a number of exceedingly practical chapters upon the character and the management of the insane from the stand-point of the nurse. The first three chapters consist of the discussion of some important elements of anatomy and physiology, and also deal with the nature of fractures, wounds, hemorrhage, heart-disease, food, strangulation, poisoning, burns, etc. Following this the nurse receives some very practical hints regarding the nature of insanity, special stress being laid upon the fact that insanity is a bodily disease. Next comes some very practical advice on ventilation, warmth, cleanliness, the manner of feeding the insane and their general management. Very practical advice is given regarding the tact to be observed in dealing with delusional and with dangerous lunatics. The matter of social entertainment for the insane, night nursing, and the management of the bedridden insane completes these very valuable lectures.

The book is one which not only commends itself to asylum nurses, but to general nurses as well.

F. X. D.

OUTLINES OF INSANITY. DESIGNED FOR THE USE OF MEDICAL PRACTITIONERS, JUSTICES OF THE PEACE, AND ASYLUM MANAGERS. By Francis H. Walmsley, M.D.

London: The Scientific Press, Limited, 1893.

These outlines, being intended for lay as well as medical readers, are as much as possible divested of technicalities. The subject is presented in a concise, clear, and somewhat popular manner. The classification of insanity adopted is, of course, purely clinical, types only being considered.

The first and second chapters deal with normal and abnormal mental action, while the insanities themselves are considered in the following order: Melancholia, mental stupor, mania, puerperal insanity, dementia, weak mind, alcoholic insanity, epileptic insanity, general paralysis of the insane. The final chapter is devoted to the causes of insanity. An appendix then follows upon the care and treatment of the insane, lunatic hospitals, and upon actions in lunacy against medical men.

The book is exceedingly practical, and not only of value to the lay reader, but also to students and men in general practice whose time is limited, or to whom larger works upon insanity are inaccessible. F. X. D.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. Edited by Charles E. Sajous, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators, and correspondents. Illustrated. Five volumes.

Philadelphia, New York, Chicago, and London: The F. A. Davis Company, 1893.

The appearance of the "Annual of the Universal Medical Sciences" is an event looked forward to with eagerness by practically every writer and advanced thinker in the country, and no doubt each of these, on the receipt of his volumes, turns to see if his most cherished contributions to medical literature have received due credit. In the great majority of cases he will not be disappointed, though even five volumes, each numbering about five hundred pages, do not give enough space to include all that has been contributed to medical science during the year. The omissions are, for the most part, unimportant.

To the active editorial staff have been added Dujardin-Beaumetz, Richardson, Lépine, Buxton, Apostoli, Obersteiner, and others of equal note, thus giving the production an international character.

In the preface the editor pays a well-deserved tribute to the value of the scientific work contributed by American authors, and calls attention to the fact that these works, for the most part, remain unseen on the continent of Europe.

In the first volume are taken up Diseases of the Lungs and Pleura, the Heart and Blood-Vessels, the Alimentary Tract and its Associated Glands, the Urinary Apparatus, Diabetes, Fevers, Rheumatism and Gout, Diseases of the Blood, and certain of the contagious diseases. Among the list of editors the names of Dolley, Benjamin Ward Richardson, Dujardin-Beaumetz, James Wilson, and F. P. Henry are notable, and assure the thoroughness and accuracy with which their several subjects are summarized.

The second volume is taken up with Diseases of the Nervous System, of the Genital Tract of Women, Obstetrics, Diseases of the New-Born, and of Infancy and Childhood. In this volume the work of Landon Carter Gray, writing of Diseases of the Brain; of Montgomery, upon Diseases of the Ovaries and Tubes; of Baldy; and of Starr and Powell, upon Dietetics and Gastric Disorders of Infancy, is particularly to be commended.

Volume III. is devoted to Surgery. Pilcher and Lloyd have summarized all that has been contributed to the Surgery of the Brain, the Spinal Cord, and the Peripheral Nerves. Gaston has collected the contributions of the year on Thoracic Surgery. John Packard has given an admirable *résumé* of Surgery of the Abdomen. Kelsey contributes a very brief and most excellent section upon Diseases of the Rectum and Anus. Keyes and Fuller have admirably summarized Genito-Urinary Surgical Diseases. The subjects of Syphilis and Chancroid are completely covered by J. William White, assisted by Furness: White's name is a sufficient guarantee of the value of this article. Lewis and Reginald Sayre have summarized the advances in Orthopædic Surgery. Stimson, on Fractures; Matas, on Aural and Facial Surgery, this article being especially full; Laplace, on Surgical Mycoses; Tiffany and Warfield, on Surgical Diseases; Booth, on Traumatic Neuroses; Packard, on Antiseptics and Surgical Dressings; and Buxton, on Anæsthetics, complete this volume. Laplace's article on Mycoses is particularly noteworthy.

The fourth volume is taken up with Diseases of the Skin, Eye, Ear, Nose and Throat, Larynx and Œsophagus, Thyroid Gland, Local Medicine, Demography, Microscopy, Histology, and Bacteriology. Van Harlingen and Oliver, as usual, have contributed, each in his own department, articles which for thoroughness and discrimination are surpassed by none in the entire selection. The section on Intubation

of the Larynx is particularly interesting, as being edited by O'Dwyer. J. Solis-Cohen has arranged his section in his customary scholarly manner. Ernst and Jackson have presented the advances in Bacteriology. Diseases of the Nose and Accessory Cavities, Histology, and Bacteriology are most satisfactorily summarized by the distinguished editor of the system, Charles E. Sajous.

In the fifth volume, Griffith's erudition is characteristically shown in the sections on General Therapeutics. That on Experimental Therapeutics, by Hare and Cerna, is also worthy of note. These sections are of peculiar interest and value. Electro-Therapeutics, edited by Rockwell; Gynæcological Therapeutics, edited by Apostoli and Jullien; Climatology, Balneology, and Hydrotherapy, by Baruch and Daniels; Hygiene and Epidemiology, by Wyman and Banks; Anomalies and Monstrosities, by Sudduth; Anatomy, Physiology, and a General Index complete the fifth and last volume. This general index is worthy of the highest praise; it is accurate and comprehensive to an unusual degree.

Sajous's System has received unstinted praise in all quarters. The THERAPEUTIC GAZETTE has already expressed its appreciation of the merits and value of this work. This last series is more worthy of commendation than any which have preceded it.

The writer and the investigator need these books on their shelves, and we believe usually have them. They would be most valuable to men remote from the centres of education and the great libraries, as indicating the advanced thought and practice of the day. Such men should constitute the bulk of the subscribers.

THE ART OF MASSAGE. By A. Creighton Hale. Profusely illustrated with original drawings.
London: The Scientific Press, Limited, 1893.

The volume before us is a full treatise upon massage. Brief chapters upon the antiquity and uses of massage, the masseuse, and the structures and functions of the body precede the more practical portions of the book. These are followed by an elaborate and detailed description of the various forms of massage and of its application to the leg and foot and arm, shoulder and hand, throat, chest and heart, the abdomen, back and hips, and the face. Its special application in anæmia, neurasthenia, and hysteria is also considered, as well as its use and application in insomnia, neuralgia, rheumatism and gout, constipation, local palsies, and so on. The text is exceedingly clear, the subject being evidently handled by a master. In addition, the book is replete with excellent illustrations. The style is popular and readable. F. X. D.

OUTLINES OF PRACTICAL HYGIENE. ADAPTED TO AMERICAN CONDITIONS. By C. Gilman Currier, M.D.
New York: E. B. Treat & Co., 1893.

What with the works on hygiene which have been contributed by American authors, and those by foreigners which are reprinted or republished in this country, the medical profession is certainly well supplied with books of this character. At the same time it is important for those who have not taken much interest in this branch of medicine to remember that the old saying that "An ounce of prevention is worth a pound of cure" is ever finding exemplification in the advances made in preventive medicine. While there are other books which are much more thorough, there is much in this work which will be of interest in connection with practical medicine, and we can recommend this contribution to the literature on hygiene, not as a substitute for the more standard works, but as a well-written hand-book of the subject.

SYLLABUS OF LECTURES ON THE PRACTICE OF SURGERY, ARRANGED IN CONFORMITY WITH THE AMERICAN TEXT-BOOK OF SURGERY. By N. Senn, M.D., Ph.D., LL.D.
Philadelphia: W. B. Saunders, 1894.

At first glance this little work would seem to be designed to supplant the "American Text-Book of Surgery," at least in so far as the student is concerned, since Senn states that its contents have been arranged in conformity with the teachings of the standard work, and that it is meant to enable the student to separate the chaff from the wheat and to memorize facts which he is expected to retain and apply at the bedside during his future professional career. A very brief review of the work will show, however, that it by no means takes the place of the larger book, but that it simply summarizes under certain general headings the more important facts explained at length in the text. This summarization is what every student naturally makes for himself with more or less success. Senn has done it very admirably, and his little syllabus should prove a real aid in preparation for an examination.

SURGICAL WARD-WORK AND NURSING: A HAND-BOOK FOR JUNIOR STUDENTS OF MEDICINE AND NURSES. By Alexander Miles, M.D., C.M., F.R.C.S. With one hundred and ninety-five illustrations.
London: The Scientific Press, Limited, 1894.

Before reading this book in a critical spirit it is well to glance over the author's preface.

In this he states that at the foot of the ladder of surgical literature there appears to be a step wanting, the junior student and nurse probationer entering on the duties of the surgical ward requiring a more detailed guide than is furnished by any of the works on minor or practical surgery already published. Although this contention as to the absence of books which may be used as safe guides at the beginning of hospital life could be contested, the need and the use of works calculated to be of service to the junior resident require no demonstration. The author remarks that it is quite exceptional to find a hospital hypodermic syringe fit for use. This seems to show that the inner workings of the English hospital do not materially differ from similar American institutions. The preparation of the patient and the treatment after operation are described, and the indications for dressings are tabulated. Under the uses of rest in surgery there are described the extension apparatus, plaster casts, and the various appliances used in the treatment of fractures of the bone. Some of these seem strange to the American student. Some of the illustrations would perhaps be a revelation to the surgeons whose names the pictured instruments bear. This is notably the case in the illustration of Péan's pressure forceps. The book contains much of value, and will probably be of service to the class of students for whom it was written.

A System of Genito-Urinary Diseases, Syphilology and Dermatology. By various authors. Edited by Prince A. Morrow, A.M., M.D. With illustrations. In three volumes. Vol. II.
New York: D. Appleton & Co., 1893.

Morrow's second volume is devoted entirely to syphilology, excepting the final chapter on chancroid by Edward Martin. Among the contributors to this volume are noted the names of J. William White, Hyde, Bulkley, Councilman, Fordyce, Morrow, Sturgis, and Charles Stedman Bull. Taylor's name is conspicuous by its absence. Hyde contributes a chapter upon the history, geographical distribution, evolution, and general pathological anatomy of syphilis. Fordyce briefly but admirably summarizes the evidence as to the etiology of syphilis. Bulkley, the modes of infection; Bronson describes the chancre; constitutional syphilis is briefly reviewed by Zeisler. Morrow contributes a most able article on syphilis of the skin. It is beautifully illustrated and written in a peculiarly clear manner. Affections of the hair and nails are treated by Alexander. Syphilis of the joints is briefly described by Hartley. Townsend writes on syphilitic affections of the bones; Mackenzie on syphilis of the upper air-passages. Councilman writes on visceral syphilis. Tuttle on syphilitic affections of the rectum and anus; Fuller on syphilis of the male and female genito-urinary system. Sachs considers syphilis of the nervous system; this article is of more than usual merit. Bullard considers hereditary syphilis of the nervous system. Bull writes on syphilis of the eye and its appendages; his contribution is one of the most valuable in the book. Syphilis of the ear, by Green, is also worthy of high praise; and Sturgis's contribution on hereditary syphilis is written in his customary admirable style. Klotz, on diagnosis and prognosis, is scholarly and instructive. The best article in the book is, no doubt, that upon the treatment of syphilis, by J. William White. It is most clear and comprehensive. Armstrong contributes an interesting chapter upon syphilis in relation to public health. This brief summarization of the subjects covered by authors whose reputations are in many cases more than national suggests the field covered by this second volume of Morrow's system. As in the first volume, the subjects have been considered from a practical point of view, more attention being devoted to etiology, diagnosis, and treatment than to historical considerations, which to the active practitioner are of minor consideration. In the main, the work has been well done, and is destined to become a standard text-book to the American practitioner.

Correspondence.

THE TREATMENT OF MAMMARY ABSCESS.

To the Editors of the Therapeutic Gazette:

Dear Sirs:—In the Therapeutic Gazette there appeared an abstract from an article written by Tweedy in the *Medical Press and Circular*, July, 1893, on a "New Treatment of Mammary Abscess." The author adopts Weber's method,—early and free incision, the breaking down of gland structure by the aid of the finger, opening up all communicating cavities, thorough curetting, and packing with strips of gauze steeped in a one-per-cent. solution of carbolic acid, followed by a large flat sponge over the breast and a tight bandage. After twenty-four hours the dressings are removed and the cavity again packed. On the third day the process is repeated. At the next dress-

ing the packing is dispensed with and the wound dressed antiseptically.

In following out this radical method of treating mammary abscess a large amount of healthy gland tissue must necessarily be destroyed; and the removal, as well as repacking, of any large quantity of gauze is a painful operation, especially so to women during the puerperium. We know from practical experience how trivial are the causes which elevate a patient's temperature after confinement, and dressings which are painful and frequently repeated must necessarily have a depressing effect during this period.

In private practice, unless it be a matter of life and death, the question of how much pain and discomfort we can avoid for our patients is one always to be carefully considered and an important factor in our success, and one frequently overlooked by men of large hospital experience.

On the other hand, I must confess that the simple opening of a mammary abscess, under all antiseptic precautions, and the thorough drainage with gauze or tube, is not as satisfactory an operation in this region as in other parts of the body. Owing to the large amount of areolar tissue, the induration around the abscess is apt to be considerable, and frequently becomes the source of other foci of pus, which, in turn, we are obliged to evacuate. If the patient be of a strumous constitution, or weak and debilitated, this condition of suppuration may last for days and the breast become riddled with sinuses.

Now, the treatment which I have adopted during the last few years is less painful, more simple, and has given in my hands most satisfactory results. Mammary abscesses will take place in the hands of the most skilful obstetricians and notwithstanding the most scrupulous care and attention to the nipples. The trouble, I believe, is not so much due to the entrance of pyogenic bacteria into the ducts, since these have been conclusively shown to be present normally in the milk before its exit from the gland, as it is due to local obstruction in the ducts or a stasis in the circulation of the capillaries and lymphatics.

During the state of congestion the liberal use of acetate of potassium and the local application of hot flaxseed poultices will frequently relieve vascular engorgement and prevent suppuration; but as soon as the temperature fluctuation or local œdema points conclusively to the presence of pus, a few simple incisions under all antiseptic precautions must be practised and a moist antiseptic dressing applied. But at the end of twenty-four or thirty-six hours it is my custom to discard all antiseptic dressings and apply every three or four hours strips of flannel or lint soaked in hot sterilized spermaceti oil. The discharge of pus will cease within a day or two and the temperature drop to normal, even if the induration does not at once disappear. The strips of lint or flannel are covered with oil silk and firm pressure is applied with a bandage. The objectionable odor of the oil can be disguised with a few drops of bergamot or gaultheria. It is a dressing much more comfortable and grateful to patients than the moist bichloride or iodoform gauze.

In treating the simple acute adenitis so frequently met with in strumous children, this oil thickly spread over a flaxseed poultice has given most excellent results.

I do not pretend to explain how or in what manner the oil acts, but the fact remains that in my hands it has been so far the most satisfactory method of treating mammary abscess.

D. T. Lainé.

Media, Pa., December, 1893.

NATURE AND TREATMENT OF ULCERS OF THE CORNEA COMPLICATED WITH HYPOPYON.

Valude makes the following abstract of a Paris thesis, by Belohous (*Annales d' Oculistique*, October, 1895). The author, after showing the different known methods of treatment of this affection, lays down the following general principles: In children, ulcers of the cornea without hypopyon, being closely connected with scrofula, ought to be treated with a tonic medication and with suitable topical applications. Ulcers with hypopyon in adults are of an infectious nature, and demand, above all, antiseptic treatment. In adults, the dry occlusive dressing with iodoform used by Valude succeeds very well in all ulcers with hypopyon uncomplicated with blennorrhœa of the lachrymal sac, with conjunctivitis, or with chronic rhinitis and ozæna. In these cases the prognosis with this method of treatment is favorable. Complicated hypopyon ulcers resist every antiseptic treatment so long as the infectious conditions which are the cause are not cured. Paracentesis of the cornea and actual cauterization are indicated only for complicated hypopyon ulcers which resist ordinary treatment, and under these circumstances the prognosis is gloomy.